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An Address
ON
THE PRESENT POSITION OF CHEMICAL PHYSIOLOGY.

Delivered before the Physiological Section of the British Association for the Advancement of Science at the meeting at Belfast, 1902.

By W. D. HALLIBURTON, M.D. Lond., F.R.S.,
PROFESSOR OF PHYSIOLOGY IN KING'S COLLEGE, LONDON; PRESIDENT OF THE SECTION.

The Present Position of Chemical Physiology.

Gentlemen,—An engineer who desires to understand thoroughly how a machine works must necessarily know its construction. If the machine becomes erratic in its action, and he wishes to put it into proper working order, a preliminary acquaintance with its normal structure and function is an obvious necessity. If we apply this to the more delicate machinery of the animal body we at once see how a knowledge of function (physiology and pathology) is impossible without a preliminary acquaintance with structure or anatomy. It is therefore not surprising—it is indeed in the nature of things—that physiology originated with the great anatomists of the past. It was not until Vesalius and Harvey by tedious dissections laid bare the broad facts of structure that any theorising concerning the uses of the constituent organs of the body had any firm foundation. Important and essential as the knowledge is that can be revealed by the scalpel the introduction and use of the microscope furnished physiologists with a still more valuable instrument. By it much that was before unseen came into view and microscopic anatomy and physiology grew in stature and knowledge simultaneously. The weapons in the armoury of the modern physiologist are multitudinous in number and complex in construction and enable him in the experimental investigation of his subject accurately to measure and to record the workings of the different parts of the machinery he has to study. But pre-eminent among the instruments stands the test-tube and the chemical operations typified by that simple piece of glass. Herein one sees at once a striking distinction between the mechanism of a living animal and that of a machine like a steam-engine or a watch. It is quite possible to be an excellent watchmaker or to drive a steam engine intelligently without any chemical knowledge of the various metals that enter into its composition. In order to set the mechanism right if it goes wrong all the preliminary knowledge which is necessary is of an anatomical nature. The parts of which an engine is composed are stable; the oil that lubricates it and the fuel that feeds it never become integral parts of the machinery. But with the living engine all this is different. The parts of which it is made take up the nutriment or fuel and assimilate it, thus building up new living substance to replace that which is destroyed by the wear and tear associated with activity. This condition of unstable chemical equilibrium is usually designated metabolism, and metabolism is the great and essential attribute of a living as compared with a non-living thing.

It seems childish at the present day, and before such an audience as this, to point out how essential it is to know the chemical structure as well as the anatomical structure of the component parts of the body. But the early anatomists to whom I have alluded had no conception of the connexion of the two sciences. Speaking of Vesalius, Sir Michael Foster says: "The great anatomist would no doubt have made use of his bitterest sarcasms had someone assured him that the fantastic school which was busy with occult secrets and had hopes of turning dross into gold would one day join hands in the investigation of the problems of life with the exact and clear anatomy so dear to him." Nor did Harvey, any more than Vesalius, pay heed to chemical learning. The scientific men of his time ignored and despised the beginning of that chemical knowledge which in later years was to become one of the foundations of physiology and the mainstay of the art of medicine. The earliest to recognise this important connexion was one whose name is usually associated more with charlatanry than with truth—namely, Paracelsus, and 50 years after the death of that remarkable and curious personality his doctrines were extended and developed by van Helmont. In spite, however, of van Helmont's remarkable insight into the processes of digestion and fermentation, his work was marred by the mysticism of the day which called in the aid of supernatural agencies to explain what could not otherwise be fully comprehended.

In the 250 years that have intervened between the death of van Helmont and the present day alchemy became a more and more exact science and changed its name to chemistry, and a few striking names stand out of men who were able to take the new facts of chemistry and to apply them to physiological uses. Of these one may mention Mayow, Lower, Boerhaave, Réaumur, Borelli, Spallanzani, and Lavoisier. Mulder in Holland and Liebig in Germany bring us almost to the present time, and I think they may be said to share the honour of being regarded as the father of modern chemical physiology. This branch of science was first placed on a firm basis by Wöhler when he showed that organic compounds can be built out of their elements in the laboratory and his first successful experiments in connexion with the comparatively simple substance urea have been followed by numberless others which have made organic chemistry the vast subject it is to-day.

Sir Michael Foster's book on the "History of Physiology," from which I have already quoted, treats of the older workers who laid the foundations of our science and whose names I have not done much more than barely mention. Those interested in the giants of the past should consult it. But what I propose to take up this morning is the work of those who have during more recent days been engaged in the later stages of the building. The edifice is far from completion even now. It is one of the charms of physiological endeavour that as the older areas yield their secrets to the explorers new ones are opened out which require equally careful investigation. If even a superficial survey of modern physiological literature is taken one is at once struck with the great preponderance of papers and books which have a chemical bearing. In this the physiological journals of to-day contrast very markedly with those of 30, 20, or even 10 years ago. The sister science of chemical pathology is making similar rapid strides. In some universities the importance of biological chemistry is recognised by the foundation of chairs that deal with that subject alone, and though in the United Kingdom, owing mainly to lack of funds, this aspect of the advance of science is not very evident, there are signs that the date cannot be far distant when every well-equipped university or university college will follow the example set us at many seats of learning on the continent and at Liverpool. With these introductory remarks let me now proceed to describe what appear to me to be the main features of chemical physiology at the present time.

The first point to which I shall direct your attention is the rapid way in which chemical physiology is becoming an exact science. Though it is less than 20 years since I began to teach physiology I can remember perfectly well a time when those who devoted their work to the chemical side of the science might almost be counted on the fingers of one hand and when chemists looked with scarcely veiled contempt on what was at that time called physiological chemistry; they stated that physiologists dealt with messes or impure materials, and therefore anything in the nature of correct knowledge was not possible. There was a good deal of truth in these statements, and if physiologists to-day cannot quite say that they have changed all that, they can at any rate assert with truth that they are changing it. This is due to a growing *rapprochement* between chemists and physiologists. Many of our younger physiologists now go through a thorough preliminary chemical training; and, on the other hand, there is a growing number of chemists—of whom Emil Fischer may be taken as a type—who are beginning to recognise the importance of a systematic study of substances of physiological interest. A very striking instance of this is seen in the progress of our knowledge of the carbohydrates which has culminated in the actual synthesis of several members of the sugar group. Another instance is seen in the accurate information we now possess of the constitution of uric acid. When Miescher began his work on the chemical composition of the nuclei of cells and separated from them the material he called nuclein he little foresaw the wide practical application of his work. We now

know that it is in the metabolism of cell-nuclei that we have to look for the oxidative formation of uric acid and other substances of the purine family. Already the chemical relationships of uric acid and nuclein have taught practical physicians some of the secrets that underlie the occurrence of gout and allied disorders.

With the time at my disposal it would be impossible to discuss all the chemico-vital problems which the physiologists of the present day are attempting to solve, but there is one subject at which many of them are labouring which seems to me to be of supreme importance—I mean the chemical constitution of proteid or albuminous substances. Proteids are produced only in the living laboratory of plants and animals; proteid metabolism is the main chemical attribute of a living thing; proteid matter is the all-important material present in protoplasm. But in spite of the overwhelming importance of the subject chemists and physiologists alike have far too long fought shy of attempting to unravel the constitution of the proteid molecule. This molecule is the most complex that is known: it always contains five, and often six, or even seven, elements. The task of thoroughly understanding its composition is necessarily vast and advance slow. But little by little the puzzle is being solved, and this final conquest of organic chemistry, when it does arrive, will furnish physiologists with new light on many of the dark places of physiological science.

The revival of the vitalistic conception in physiological work appears to me a retrograde step. To explain anything we are not fully able to understand in the light of physics and chemistry by labeling it as vital or something we can never hope to understand is a confession of ignorance and, what is still more harmful, a bar to progress. It may be that there is a special force in living things that distinguishes them from the inorganic world. If this is so, the laws that regulate this force must be discovered and measured, and I have no doubt that those laws when discovered will be found to be as immutable and regular as the force of gravitation. I am, however, hopeful that the scientific workers of the future will discover that this so-called vital force is due to certain physical or chemical properties of living matter which have not yet been brought into line with the known chemical and physical laws that operate in the inorganic world, but which, as our knowledge of chemistry and physics increases, will ultimately be found to be subservient to such laws.

Let me take as an example the subject of osmosis. The laws which regulate this phenomenon through dead membranes are fairly well known and can be experimentally verified, but in the living body there is some other manifestation of force which operates in such a way as to neutralise the known force of osmosis. Is it necessary to suppose that this force is a new one? May it not rather be that our much-vaunted knowledge of osmosis is not yet complete? It is quite easy to understand why a dead and a living membrane should behave differently in relation to substances that are passing through them. The molecules of the dead membrane are, comparatively speaking, passive and stable; the molecules in a membrane made of living cells are in a constant state of chemical integration and disintegration; they are the most unstable molecules we know. Is it to be expected that such molecules would allow water, or substances dissolved in water, to pass between them and remain entirely inactive? The probability appears to me to be all the other way; the substances passing, or attempting to pass, between the molecules will be called upon to participate in the chemical activities of the molecules themselves, and in the building up and breaking down of the compounds so formed there will be a transformation of chemical energy and a liberation of what looks like a new force. Before a physicist decides that his knowledge of osmosis is final let him attempt to make a membrane of some material which is in a state of unstable chemical equilibrium, a state in some way comparable to what is called metabolism in living protoplasm. I cannot conceive that such a task is insuperable, and when accomplished, and the behaviour of such a membrane in an osmometer or dialyser is studied, I am convinced that we shall find that the laws of osmosis as formulated for such dead substances as we have hitherto used will be found to require revision.

Such an attitude in reference to vital problems appears to be infinitely preferable to that which too many adopt of passive content, saying that the phenomenon is vital and there is an end of it. When a scientific man says this or that vital phenomenon cannot be explained by the laws of chemistry and physics, and therefore must be regulated by laws of some other nature, he most unjustifiably assumes that the laws of chemistry and physics have all been discovered. He forgets, for instance, that such an important detail as the constitution of the proteid molecule has still to be made out. The recent history of science gives an emphatic denial to such a supposition. All my listeners have within the last few years seen the discovery of the Roentgen rays and the modern development of wireless telegraphy. On the chemical side we have witnessed the discovery of new elements in the atmosphere and the introduction of an entirely new branch of chemistry called physical chemistry. With such examples ready to our hands, who can say what further discoveries will not shortly be made, even in such well-worked fields as chemistry and physics?

The mention of physical chemistry brings me to what I may term the second head of my discourse, the second striking characteristic of modern chemical physiology: this is the increasing importance which physiologists recognise in a study of inorganic chemistry. The materials of which our bodies are composed are mainly organic compounds, among which the proteids stand out as pre-eminently important; but everyone knows that there are many substances of the mineral or inorganic kingdom present in addition. I need hardly mention the importance of water, of the oxygen of the air, and of salts like sodium chloride and calcium phosphate.

The new branch of inorganic chemistry called physical chemistry has given us entirely new ideas of the nature of solutions, and the fact that electrolytes in solution are broken up into their constituent ions is one of fundamental importance. One of the many physiological aspects of this subject is seen in a study of the action of mineral salts in solution on living organisms and parts of organisms. Many years ago Dr. Ringer showed that contractile tissues (heart, cilia, &c.) continue to manifest their activity in certain saline solutions. Howell goes so far as to say, and probably correctly say, that the cause of the rhythmical action of the heart is the presence of these inorganic substances in the blood or lymph which usually bathes it. The subject has more recently been taken up by Loeb and his colleagues at Chicago: they confirm Ringer's original statements but interpret them now as ionic action. Contractile tissues will not contract in pure solutions of non-electrolytes like sugar or albumin. But different contractile tissues differ in the nature of the ions which are their most favourable stimuli. An optimum salt solution is one in which stimulating ions, like those of sodium, are mixed with a certain small amount of those which, like calcium, restrain activity. Loeb considers that the ions act because they affect either the physical condition of the colloidal substances (proteid, &c.) in protoplasm or the rapidity of chemical processes. Amœboid movement, ciliary movement, the contraction of muscle, cell division, and karyokinesis all fall into the same category as being mainly dependent on the stimulating action of ions. Loeb has even gone so far as to consider that the process of fertilisation is mainly ionic action; he denies that the nuclein of the male cell is essential, but asserts that all it does is to act as the stimulus in the due adjustment of the proportions of the surrounding ions, and supports this view by numerous experiments on ova in which without the presence of spermatozoa he has produced larvæ by merely altering the saline constituents and so the osmotic pressure of the fluid that surrounds them. Whether such a sweeping and almost revolutionary notion will stand the test of further verification must be left to the future; so also must the equally important idea that nervous impulses are to be mainly explained on an electrolytic basis. But whether or not all the details of such work will stand the test of time, the experiments I have briefly alluded to are sufficient to show the importance of physical chemistry to the physiologist, and they also form a useful commentary on what I was saying just now about vitalism. Such eminently vital phenomena as movement and fertilisation are to be explained in whole or in part as due to the physical action of inorganic substances. Are not such suggestions indications of the undesirability of postulating the existence of any special mystic vital force?

I have spoken up to this point of physical chemistry as a branch of inorganic chemistry; there are already indications of its importance also in relation to organic chemistry. Many eminent chemists consider that the future advance of organic chemistry will be on the new physical lines. It is

impossible to forecast where this will lead us; suffice it to say that not only physiology but also pathology, pharmacology, and even therapeutics, will receive new accessions to knowledge the importance of which will be enormous.

I have now briefly sketched what appear to me to be the two main features of the chemical physiology of to-day, and the two lines, organic and inorganic, along which I believe it will progress in the future. Let me now press upon you the importance in physiology, as in all experimental sciences, of the necessity first of bold experimentation, and, secondly, of bold theorising from experimental data. Without experiment all theorising is futile; the discovery of gravitation would never have seen the light if laborious years of work had not convinced Newton that it could be deduced from his observations. The Darwinian theory was similarly based upon data and experiments which occupied the greater part of its author's lifetime to collect and to perform. Pasteur in France and Virchow in Germany supply other instances of the same devotion to work which was followed by the promulgation of wide-sweeping generalisations. And after all it is the general law which is the main object of research; isolated facts may be interesting and are often of value, but it is not until facts are correlated and the discoverers ascertain their inter-relationships that anything of epoch-making importance is given to the world. It is, however, frequently the case that a thinker with keen insight can see the general law even before the facts upon which it rests are fully worked out. Often such bold theorisers are right, but even if they ultimately turn out to be wrong, or only partly right, they have given to their fellows some general idea on which to work; if the general idea is incorrect it is important to prove it to be so in order to discover what is right later. No one has ever seen an atom or a molecule, yet who can doubt that the atomic theory is the sheet anchor of chemistry? Mendeleeff formulated his periodic law before many of the elements were discovered; yet the accuracy of this great generalisation has been such that it has actually led to the discovery of some of the missing elements.

I purpose to illustrate these general remarks by a brief allusion to two typical sets of researches carried out during recent years in the region of chemical physiology. I do not pretend that either of them has the same overwhelming importance as the great discoveries I have alluded to, but I am inclined to think that one of them comes very near to that standard. The investigations in question are those of Ehrlich and of Pawlow. The work of Ehrlich mainly illustrates the useful part played by bold theorising, the work of Pawlow that played by the introduction of new and bold methods of experiment.

I will take Pawlow first. This energetic and original Russian physiologist has by his new methods succeeded in throwing an entirely new light on the processes of digestion. Ingeniously devised surgical operations have enabled him to obtain the various digestive juices in a state of absolute purity and in large quantity. Their composition and their actions on the various foodstuffs have thus been ascertained in a manner never before accomplished; an apparently unfailing resourcefulness in devising and adapting experimental methods has enabled him and his fellow workers to discover the paths of the various nerve impulses by which secretion in the alimentary canal is regulated and controlled. The importance of the psychical element in the process of digestion has been experimentally verified. If I were asked to point out what I considered to be the most important outcome of all this painstaking work, I should begin my answer by a number of negatives, and would say, not the discovery of the secretory nerves of the stomach or pancreas; not the correct analysis of the gastric juice or the fact that the intestinal juice has most useful digestive functions; all of these are discoveries of which anyone might have been rightly proud; but after all they are more or less isolated facts. The main thing that Pawlow has shown is that digestion is not a succession of isolated acts, but each one is related to its predecessor and to that which follows it; the process of digestion is thus a continuous whole; for example, the acidity of the gastric juice provides for a delivery of pancreatic juice in proper quantity into the intestine; the intestinal juice acts upon the pancreatic, and so enables the latter to perform its powerful actions. I am afraid that this example, as I have tersely stated it, presents the subject rather inadequately, but it will serve to show what I mean. Further, the composition of the various juices is admirably adjusted to the needs of the organism; when there is much proteid to be digested the proteolytic activity of the juices secreted is correspondingly high, and the same is true for the other constituents of the food. It is such general conclusions as these, the correlation of isolated facts leading to the formulation of the law that the digestive process is continuous in the sense I have indicated and adapted to the needs of the work to be done, that constitute the great value of the work from the Russian laboratory. Work of this sort is sure to stimulate others to fill in the gaps and complete the picture, and already has borne fruit in this direction. It has, for instance, in Starling's hands led to the discovery of a chemical stimulus to pancreatic secretion. This is formed in the intestine as the result of the action of the gastric acid, and taken by the blood-stream to the pancreas. Whether this *secretin*, as it is called, may be one of a group of similar chemical stimuli which operate in other parts of the body has still to be found out.

The other series of researches to which I referred are those of Ehrlich and his colleagues and followers on the subject of immunity. This subject is one of such importance to every one of us that I am inclined to place the discovery on a level with those great discoveries of natural laws to which I alluded at the outset of this portion of my address. I hesitate to do so yet, because many of the details of the theory still await verification. But up to the present all is working in that direction, and Ehrlich's ideas illustrate the value of bold theorising in the hands of clear-sighted and far-seeing individuals. But when I say that the doctrine is bold, I do not mean to infer that the experimental facts are scanty; they are just the reverse. But in the same way that a chemist has never seen an atom and yet he believes atoms to exist, so no one has yet ever seen a toxin or an anti-toxin in a state of purity, and yet we know they exist and this knowledge promises to be of incalculable benefit to suffering humanity.

It may not be uninteresting to state briefly, for the benefit of those to whom the subject is new, the main facts and an outline of the theory which is based upon them. We are all aware that one attack of many infective maladies protects us against another attack of the same disease. The person is said to be *immune* either partially or completely against that disease. Vaccination produces in a patient an attack of cowpox or vaccinia. This disease is related to small-pox and some still hold that it is small-pox modified and rendered less malignant by passing through the body of a calf. At any rate an attack of vaccinia renders a person immune to small-pox or variola for a certain number of years. Vaccination is an instance of what is called *protective inoculation*, which is now practised with more or less success in reference to other diseases like plague and typhoid fever. The study of immunity has also rendered possible what may be called *curative inoculation* or the injection of antitoxic material as a cure for diphtheria, tetanus, snake poisoning, &c. The power the blood possesses of slaying bacteria was first discovered when the effort was made to grow various kinds of bacteria in it; it was looked upon as probable that blood would prove a suitable soil or medium for this purpose. It was found in some instances to have exactly the opposite effect. The chemical characters of the substances which kill the bacteria are not fully known; indeed, the same is true for most of the substances we have to speak of in this connexion. Absence of knowledge on this particular point has not, however, prevented important discoveries from being made. So far as is known at present, the substances in question are proteid in nature. The bactericidal powers of blood are destroyed by heating it for an hour at 56° C. Whether the substances are enzymes is a disputed point. So also is the question whether they are derived from the leucocytes; the balance of evidence appears to me to be in favour of this view in many cases at any rate, and phagocytosis becomes more intelligible if this view is accepted. The substances, whatever be their source or their chemical nature, are sometimes called alexins, but the more usual name now applied to them is that of *bacterio-lysins*. Closely allied to the bactericidal power of blood or blood serum is its globulicidal power. By this one means that the blood serum of one animal has the power of dissolving the red blood-corpuscles of another species. If the serum of one animal is injected into the blood-stream of an animal of another species the result is a destruction of its red corpuscles, which may be so excessive as to lead to the passing of the liberated hæmoglobin into the urine (hæmoglobinuria). The substance or substances in the serum that possess this property are called *hæmolysins*, and though there is some doubt whether bacteriolysins and hæmo-lysins are absolutely identical there is no doubt that they are closely related substances.

Another interesting chemical point in this connexion is the fact that the bactericidal power of the blood is closely related to its alkalinity. Increase of alkalinity means increase of bactericidal power. Venous blood contains more diffusible alkali than arterial blood and is more bactericidal; dropsical effusions are more alkaline than normal lymph and kill bacteria more easily. In a condition like diabetes, when the blood is less alkaline than it should be, the susceptibility to infectious disease is increased. Alkalinity is probably beneficial because it favours those oxidative processes in the cells of the body which are so essential for the maintenance of healthy life. Normal blood possesses a certain amount of substances which are inimical to the life of our bacterial foes. But suppose a person gets run down; everyone knows that he is then liable to "catch anything." This coincides with a diminution in the bactericidal power of his blood. But even a perfectly healthy person has not an unlimited supply of bacterio-lysin, and if the bacteria are sufficiently numerous he will fall a victim to the disease they produce. Here, however, comes in the remarkable part of the defence. In the struggle he will produce more and more bacterio-lysin, and if he gets well it means that the bacteria are finally vanquished, and his blood remains rich in the particular bacterio-lysin he has produced, and so will render him immune to further attacks from that particular species of bacterium. Every bacterium seems to cause the development of a specific bacterio-lysin. Immunity can more conveniently be produced gradually in animals, and this applies, not only to the bacteria, but also to the toxins they form. If, for instance, the bacilli which produce diphtheria are grown in a suitable medium they produce the diphtheria poison, or toxin, much in the same way that yeast-cells will produce alcohol when grown in a solution of sugar. Diphtheria toxin is associated with a proteose, as is also the case with the poison of snake venom. If a certain small dose called a "lethal dose" is injected into a guinea-pig the result is death. But if the guinea-pig receives a smaller dose it will recover; a few days after it will stand a rather larger dose and this may be continued until after many successive gradually increasing doses it will finally stand an amount equal to many lethal doses without any ill-effects. The gradual introduction of the toxin has called forth the production of an antitoxin. If this is done in the horse instead of the guinea-pig the production of antitoxin is still more marked and the serum obtained from the blood of an immunised horse may be used for injecting into human beings suffering from diphtheria and rapidly cures the disease. The two actions of the blood, antitoxic and antibacterial, are frequently associated but may be entirely distinct.

The antitoxin is also a proteid probably of the nature of a globulin; at any rate, it is a proteid of a larger molecular weight than a proteose. This suggests a practical point. In the case of snake-bite the poison gets into the blood rapidly owing to the comparative ease with which it diffuses, and so it is quickly carried all over the body. In treatment with the antitoxin or antivenin speed is everything if life is to be saved; injection of this material under the skin is not much good, for diffusion into the blood is too slow. It should be injected straight away into a blood-vessel. There is no doubt that in these cases the antitoxin neutralises the toxin much in the same way that an acid neutralises an alkali. If the toxin and antitoxin are mixed in a test-tube, and time allowed for the interaction to occur, the result is an innocuous mixture. The toxin, however, is merely neutralised, not destroyed: for if the mixture in the test-tube is heated to 68° C. the antitoxin is coagulated and destroyed and the toxin remains as poisonous as ever.

Immunity is distinguished into *active* and *passive*. Active immunity is produced by the development of protective substances in the body; passive immunity by the injection of a protective serum. Of the two the former is the more permanent. *Ricin*, the poisonous proteid of castor-oil seeds, and *abrin*, that of the Jequirity bean, also produce when gradually given to animals an immunity, due to the production of antiricin and antiabrin respectively. Ehrlich's hypothesis to explain such facts is usually spoken of as the *side-chain theory* of immunity. He considers that the toxins are capable of uniting with the protoplasm of living cells by possessing groups of atoms like those by which nutritive proteids are united to cells during normal assimilation. He terms these *haptophor* groups and the groups to which these are attached in the cells he terms *receptor* groups. The introduction of a toxin stimulates an excessive production of receptors, which are finally thrown out into the circulation, and the free circulating receptors constitute the antitoxin. The comparison of the process to assimilation is justified by the fact that non-toxic substances like milk introduced gradually by successive doses into the blood-stream cause the formation of anti-substances capable of coagulating them.

Up to this point I have spoken only of the blood, but month by month workers are bringing forward evidence to show that other cells of the body may by similar measures be rendered capable of producing a corresponding protective mechanism.

One further development of the theory I must mention. At least two different substances are necessary to render a serum bactericidal or globulicidal. The bacterio-lysin or hæmolysin consists of these two substances. One of these is called the *immune body*, the other the *complement*. We may illustrate the use of these terms by an example. The repeated injection of the blood of one animal—e.g., the goat—into the blood of another animal—e.g., a sheep—after a time renders the latter animal immune to further injections, and at the same time causes the production of a serum which dissolves readily the red blood-corpuscles of the first animal. The sheep's serum is thus hæmolytic towards goat's blood-corpuscles. This power is destroyed by heating to 56° C. for half an hour, but returns when fresh goat's serum is added. The specific immunising substance formed in the sheep is called the immune body; the ferment-like substance destroyed by heat is the complement. The latter is not specific since it is furnished by the blood of non-immunised animals, but it is nevertheless essential for hæmolysis. Ehrlich believes that the immune body has two side groups—one which connects with the receptor of the red corpuscles and one which unites with the haptophor group of the complement and thus renders possible the ferment-like action of the complement on the red corpuscles. Various anti-bacterial serums which have not been the success in treating disease they were expected to be are probably too poor in complement, though they may contain plenty of the immune body. Quite distinct from the bactericidal, globulicidal, and antitoxic properties of blood is its agglutinating action. This is another result of infection with many kinds of bacteria or their toxins. The blood acquires the property of rendering immobile and clumping together the specific bacteria used in the infection. The test applied to the blood in cases of typhoid fever and generally called Widal's reaction depends on this fact. The substances that produce this effect are called *agglutinins*. They also are probably proteid-like in nature, but are more resistant to heat than the lysins. Prolonged heating to over 60° C. is necessary to destroy their activity.

Lastly, we come to a question which more directly appeals to the physiologist than the preceding, because experiments in relation to immunity have furnished us with what has hitherto been lacking—a means of distinguishing human blood from the blood of other animals. The discovery was made by Tchistovitch (1899) and his original experiment was as follows: rabbits, dogs, goats, and guinea-pigs were inoculated with eel-serum, which is toxic; he thereby obtained from these animals an antitoxic serum. But the serum was not only antitoxic, but produced a precipitate when added to eel-serum but not when added to the serum of any other animal; in other words, not only has a specific antitoxin been produced but also a specific *precipitin*. Numerous observers have since found that this is a general rule throughout the animal kingdom, including man. If, for instance, a rabbit is treated with human blood the serum ultimately obtained from the rabbit contains a specific precipitin for human blood; that is to say, a precipitate is formed on adding such a rabbit's serum to human blood, but not when added to the blood of any other animal.[2] The great value of the test is its delicacy: it will detect the specific blood when it is greatly diluted, after it has been dried for weeks, or even when it is mixed with the blood of other animals.

I have entered into this subject at some length because it so admirably illustrates the kind of research which is now in progress; it is also of interest to others than mere physiologists. I have not by an means exhausted the subject, but

[2] There may be a slight reaction with the blood of allied animals; for instance, with monkey's blood in the case of man.

for fear I may exhaust my audience let me hasten to a conclusion. I began by eulogising the progress of the branch of science on which I have elected to speak to you. Let me conclude with a word of warning on the danger of over-specialisation. The ultra-specialist is apt to become narrow, to confine himself so closely to his own groove that he forgets to notice what is occurring in the parallel and intercrossing grooves of others. But those who devote themselves to the chemical side of physiology run but little danger of this evil. The subject cannot be studied apart from other branches of physiology, so closely are both branches and roots intertwined. As an illustration of this may I be permitted to speak of some of my own work? During the past few years the energies of my laboratory have been devoted to investigations on the chemical side of nervous activity and I have had the advantage of coöperating to this end with a number of investigators, of whom I may particularly mention Dr. F. W. Mott and Dr. T. G. Brodie. But we soon found that any narrow investigation of the chemical properties of nervous matter and the changes this undergoes during life and after death was impossible. Our work extended in a pathological direction so as to investigate the matter in the brains of those suffering from nervous disease; it extended in a histological direction so as to determine the chemical meaning of various staining reactions presented by normal and abnormal structures in the brain and spinal cord; it extended in an experimental direction in the elucidation of the phenomena of fatigue and to ascertain whether there was any difference in medullated and non-medullated nerve-fibres in this respect; it extended into what one may call a pharmacological direction in the investigation of the action of the poisonous products of the breakdown of nervous tissues. I think I have said enough to show you how intimate are the connexions of the chemical with the other aspects of physiology and although I have given you but one instance, that which is freshest to my mind, the same could be said for almost any other well-planned piece of research work of a bio-chemical nature.

We have now before us the real work of the section, the reading, hearing, and seeing the researches which will be brought forward by members of the Association, and I must, in thanking you for your attention, apologise for the length of time I have kept you from these more important matters.

A Clinical Lecture

ON

ACUTE INFANTILE BRONCHO-PNEUMONIA (BRONCHO-PNEUMONITIS).

BASED ON THE CLINICAL, PATHOLOGICAL, AND HÆMATOLOGICAL PHENOMENA OBSERVED IN THREE FATAL CASES.

Delivered in the Glasgow Royal Infirmary on Feb. 10th, 1902,

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THERE is, perhaps, no disease of infancy and childhood concerning which it is more difficult to form a precise conception as to etiology, pathology, and diagnosis than that to which the terms "broncho-pneumonia," "lobular pneumonia," and "capillary bronchitis" have indifferently, and on the whole with fair accuracy as regards the essential phenomena, been applied. As to the clinical phenomena of broncho-pneumonia it may, perhaps, be admitted that there is a general uniformity of the more prominent symptoms in the different cases met with in practice, especially in the acute forms; but when the etiology, the clinical course, the morbid anatomy, the histology, and the bacteriology of the disease are considered we find ourselves face to face with many and difficult problems. Are we dealing with one morbid condition of the respiratory system or with several? Are the different types or forms which we meet with in practice separate diseases or mere variations of one and the same morbid process? Why do some cases tend rapidly to death in a few days and others as rapidly to get well? Are the cases which from the first are subacute and lead on to a long course of chronic respiratory illness, not infrequently ending fatally or in pulmonary tuberculosis, essentially the same in etiology and pathology as the more acute forms? Are broncho-pneumonia and lobar pneumonia the same or different? These are a few of the problems which are constantly suggesting themselves to every practitioner of experience, and it must be admitted that, even with our greatly increased knowledge of the pathology and bacteriology of the conditions concerned, no very satisfactory solutions are yet possible. These considerations, then, sufficiently explain to you why I have determined to make the three fatal cases of acute infantile broncho-pneumonia which we have recently watched in the ward, and two of which we have followed to the post-mortem theatre, the text of a clinical lecture on this very common and exceedingly fatal disease. Let me first of all by means of brief summaries of the reports in the ward journal recall the three cases to your memories.

CASE 1.—The patient, aged nine months, was admitted to Ward 8 on Nov. 19th, 1901, and died on the 20th. His mother took him out, as she was in the habit of doing, on the evening of Nov. 16th between 7 and 8 o'clock and she thinks he caught cold on that occasion, as next day he was "running at the nose" and his bowels were constipated, the latter condition, however, having been present for some days before. Her medical attendant prescribed a powder for the constipation, but no cough or difficulty of breathing was noted till the day before admission when the mother felt a "crackling" if she placed her hand over the child's chest. At this time, too, the abdomen was much swollen. The cough was not very frequent or vigorous. The patient had always been rather a delicate child, suffering more or less from cough; and he had "green diarrhœa" very severely when he was a month old. Of a family of eight children three died in infancy from "lung trouble" or "dregs of the measles." On admission the patient was very ill, the face being pallid and livid, and the respirations very shallow and rapid, numbering from 80 to 94 per minute, and occasionally somewhat of the Cheyne-Stokes type—i.e., shallow and forced breathing alternating; the alæ nasi dilated vigorously, the intercostal spaces were sucked in during inspiration, and the pulse was so rapid, small, and thready that it could not be counted. The shape of the head suggested a rachitic diathesis and the temperature during residence ranged between 103° and 104° F. Over the right apex in front there was a dull, or dull tympanitic, note with intense tubular breathing, latterly associated with medium crackling râles. At the right base posteriorly there was marked dulness, the respiratory murmur was harsh but not tubular, and there were numerous crackling râles with inspiration. Percussion over the left lung was generally resonant, except in the infra-spinous region behind where it was impaired, and râles were nowhere so prominent as on the right side. The abdomen was somewhat distended and the bowels were loose, the motions being light yellow in colour but not very copious. Two blood-counts were made by my resident, Dr. J. Scott, with the following results. On Nov. 19th, 1901, examined in the fresh state the red blood corpuscles formed characteristic rouleaux. Hæmoglobin, 60 per cent.; red blood corpuscles, 2,276,000; and white blood corpuscles, 15,212. A differential count of the leucocytes gave these results: polymorphonuclear, 79·5 per cent.; lymphocytes, 16·6 per cent.; and large mononuclear, 1·9 per cent. On Nov. 20th at 12 noon: hæmoglobin, 60 per cent.; red blood corpuscles, 2,037,500; and white blood corpuscles, 12,000. Death took place at 8 P.M. You witnessed the post-mortem examination of this case on Nov. 21st, 1901, and I shall now read to you Dr. Charles Workman's report.

Summary.—Pleurisy of right side; pericarditis; partial collapse of left lung. *External appearances.*—A fairly well-nourished body, with rather large head and open fontanelles. *Thorax.*—The left lung is free from pleural adhesions. The right lung is adherent over most of the lower lobe from a fresh fibrinous pleurisy. The upper lobe of the right lung is in part consolidated, so that a portion sinks at once in water. This consolidation appears to be due to œdema for the most part and it does not appear congested. The left lung shows some small areas of collapse but otherwise appears healthy. The pericardium shows a well-marked fibrinous pericarditis but contains very little fluid.

The heart presents remarkably healthy characters. *Abdomen.*—The stomach is normal in size and contains a quantity of coagulated milk. Its mucous membrane is in a condition of catarrh. There is slight general catarrh of the intestine and the Peyer's patches near the ileo-cæcal valve are somewhat congested. The liver is slightly enlarged but otherwise healthy. The spleen is much enlarged and congested. The kidneys present very healthy characters. The mesenteric lymphatic glands are perhaps unduly prominent but are not definitely diseased.

Dr. Walter K. Hunter has made a series of sections of the lungs in this case which I shall shortly describe to you, and you will then see that the consolidation at the right apex was inflammatory and not œdematous and that the so-called "small areas of collapse" are in reality small areas of inflammation. The bacteriology of the case, which was investigated by Mr. D. McCrorie, I will speak of at a later part of the lecture.

CASE 2.—The patient, aged 15 months, was admitted to Ward 8 on Dec. 2nd, 1901, and died on the 6th. About two months before admission he suffered from an attack of "pneumonia," for which he was treated at the Sick Children's Dispensary and from which he had apparently recovered about Nov. 13th. This illness, however, left some cough behind and on the evening of Nov. 30th it was observed that he had suddenly become much worse. He refused food, moaned a great deal, and became very short of breath. His skin was very hot and his cough was frequent but not violent or accompanied by any expectoration. The day before admission he was seen at the dispensary by Dr. J. W. Findlay and admitted as a case of acute pneumonia. During residence in the ward the temperature, taken four-hourly, ranged between 101° and 104° F., but on the first night it was as high as 104·8°; the pulse averaged 145 per minute, with one maximum of 176 and two minima of 132; the respirations averaged 76, with one maximum of 94 and one minimum of 61. The breathing was all along very shallow and the cough, though frequent, was not violent. The pulmonary physical signs were chiefly confined to the right lung; over the right side of the thorax there were diminished movement and dulness in the right infra-clavicular and right infrascapular regions with resonance in the right axillary region. Over the dull areas of the right side the respiratory murmur was always audible and of tubular type; and during the last two days over the whole right lung, but particularly at the base, numerous coarse crackling râles were heard. Over the left lung the respiratory murmur was everywhere of vesicular though harsh character and no special dulness or crackling râle was at any time noted. The question of empyema at the right base was raised on Dec. 3rd, 1901, but in view of the abundant breath-sound over the dull area I decided not to use the exploring needle. Pale lividity of the face was marked throughout and on the evening of the 5th swelling of the hands was observed. On the morning of the 6th the lividity was much more pronounced and there was very marked œdema of the hands and arms, while there was no trace of dropsy in the lower limbs or trunk. I regarded this localised dropsy of the upper limbs as indicative of severe pleural involvement, probably empyema, and so I explored the right side of the chest in three different spots but with quite negative results. The child died in the afternoon. Blood-counts by Dr. Scott.—Dec. 2nd, 1901: hæmoglobin, 78 per cent.; red blood corpuscles, 3,750,000; and white blood corpuscles, 12,500. Dec. 3rd: hæmoglobin, 65 per cent.; red blood corpuscles, 17,921 and 8192 at midnight; and lymphocytes, 37 per cent. Dec. 4th: hæmoglobin, 65 per cent.; the white blood corpuscles in seven counts ranged from 6400 in the morning to 13,800 at midnight, the lymphocytes from 38 to 50 per cent. Dec. 5th: hæmoglobin, 58 per cent.; white blood corpuscles, 16,000; and lymphocytes, 33 per cent. The average of these observations gives us 12,485 white blood corpuscles per cubic millimetre and 39·5 per cent. of lymphocytes, with a maximum of 17,921 leucocytes and a minimum of 6400 at midnight. On Dec. 9th you saw the post-mortem examination of this child and I now read to you Dr. Workman's report:—

Summary.—Double pleurisy fibrinous; catarrhal pneumonia of right lung. *External appearances.*—A fairly well-developed and somewhat emaciated body. Post mortem rigidity has passed off. *Thorax.*—On opening the thorax the posterior parts of both lower lobes of the lungs are found to be covered with a thick layer of recent fibrin. The right lower lobe is collapsed so that it will sink at once in water. The upper lobe presents a large cavity or cyst which is lined by a smooth non-inflammatory membrane, and is partially subdivided by septs, which are covered by the same smooth membrane. From this appearance this cavity is of old standing and is probably congenital. The anterior part of the upper lobe is consolidated by a catarrhal pneumonia and the bronchi contain a quantity of purulent mucus, which appears in large drops on the cut surface when the tissue is compressed. The left lung is comparatively healthy and a portion of the lower lobe when thrown into water floats readily. The heart presents very healthy characters. *Abdomen.*—The liver is somewhat congested but is otherwise healthy. The gall-bladder contains fluid bile. The spleen is somewhat congested. The stomach appears quite healthy, as are also the kidneys.

I had intended that the lungs in this case should also have been subjected to microscopic examination and had given instructions to this effect, but unfortunately the organs were lost in the pathological department. Mr. D. McCrorie's bacteriological report I will read to you a little further on.

CASE 3.—The patient, aged one year and 10 months, was admitted to Ward 8 on Dec. 12th, 1901, and died the next day. The child had suffered from measles about two months before admission and since this illness she had never regained strength. About a fortnight before entering the ward she began to cough and to be very drowsy and by Dec. 6th she was obviously very ill. On the evening of that day the cough was very severe and hard and the breathing was very rapid. She refused food but was very thirsty. Her skin was very hot and remained so until the 10th, but since that date the mother thought it had not been quite so feverish. Dr. A. Galbraith Faulds saw her on Dec. 8th and diagnosed pneumonia. On the 12th he saw her again and sent her to the infirmary. The father and mother were healthy; of five children three survived; one had died from inflammation of the lungs after a week's illness and the other from convulsions following measles. The condition of the child on entering the ward was very critical. Dr. Scott's note informed us that the face was greatly cyanosed; that the respirations were very rapid, numbering 103 per minute; and that cough occurred in frequent severe paroxysms, followed by some white frothy mucus that had to be wiped from the mouth after the seizure. The temperature was 100·4° F. and the pulse was so rapid that it could not be counted. No dulness was anywhere detected, but over the whole chest fine crepitant râles, chiefly with inspiration, could be heard; the râles were more abundant and of coarser quality at the left apex in front and at the right base behind. The heart's action was very feeble and no precise note of its condition was possible. The abdomen was not much distended, the spleen was not palpable, and the hepatic area was not increased. On the morning of the 13th I saw the patient at our ward visit, and if I read to you the note which I then dictated it will indicate to you sufficiently the further course of the case.

The child this morning is critically ill and lies in bed without noticing much and without much resistance to being handled. The breathing is exceedingly rapid and the expirations are laboured and panting. There is very vigorous action of the alæ nasi. The complexion is very pale but after a fit of coughing there is considerable lividity. The temperature has been gradually rising from 102° F. at 8 P.M. last night to 103° at 8 A.M. this morning. No dulness can be detected at any part of the surface of the chest but at the right base behind and at the right apex in front numerous fine liquid râles, chiefly on inspiration, are detected. All the phenomena indicate a severe acute capillary bronchitis or broncho-pneumonia.

Such was my note of the condition on the morning of Dec. 13th. The child died on the night of the same day at 11.15. At 8 P.M. the temperature was 105°, and at 11 P.M. it was 106°. Two convulsions occurred at 5 P.M. and 8 P.M., in which on the whole the left side of the body was more involved. During residence the bowels were loose, having been moved seven times. The following are the blood counts as taken by Dr. Scott. The fresh specimens showed little tendency to rouleaux formation and there was very great leucocytosis. Dec. 12th: hæmoglobin, 90 per cent.; 11 A.M., red blood corpuscles, 4,800,000, and white blood corpuscles, 236,000. Dec. 13th: hæmoglobin, 60 per cent.; 11 A.M.: white blood corpuscles, 227,810. Differential count: polymorphonuclear leucocytes, 33·6 per cent.; lymphocytes, 50·2 per cent.; large mononuclear, 15·2 per cent.; and eosinophiles, 0·57 per cent. There was no post-mortem examination.

NOMENCLATURE.

Three names, as I have stated at the beginning of this lecture, are indifferently applied to the acute pulmonary disorder of children at present under consideration: the names are "acute lobular pneumonia," "acute broncho-pneumonia," and "acute capillary bronchitis." Such a terminology, applied to what is generally regarded as an independent disease, indicates a considerable divergence of opinion as to its clinical history and its pathological anatomy, and it must

be admitted that there are prominent features in the symptomatology and the morbid anatomy of the disease which could be adduced in support of each or all of the terms, especially of the first two. At the same time, it is not to be doubted that the disease would be better designated, if that were possible, by one term than by several. I do not know whether such a simplification of nomenclature can at present be accomplished, but perhaps a few critical remarks may indicate the direction in which such a satisfactory result might be attained. If the term "acute lobular pneumonia" could be abolished I think it would tend towards the simplification which I desiderate. The name infers a relationship between acute lobar pneumonia and the disease we are considering which I believe does not exist either clinically or anatomically. Perhaps the use of the word "pneumonia" in the name is more to blame for this erroneous conception of the relationship of the two diseases than the term "lobular." That the pulmonary consolidations in acute broncho-pneumonia are multiple, scattered, and usually of moderate size justifies the use of the term "lobular," but neither the macroscopic nor the microscopic nature of the consolidated areas indicates that they in any way are related to the lesion of acute lobar pneumonia. Hence I am of opinion that the term "lobular pneumonia" should not be used.

As regards the name "broncho-pneumonia," the same objection applies to the use of the word "pneumonia." The pulmonary lesion in acute lobar pneumonia is a fairly constant one, limited to certain definite histological elements as a rule, and generally as definite in its development as is the clinical course of the disease itself. Such constancy of structural development is not present in acute infantile broncho-pneumonia. As I shall shortly point out to you in two of our cases we have had to deal with a generalised inflammatory lesion of the respiratory apparatus involving all the histological elements, the bronchioles, the alveoli, the interstitial connective tissue, the pleura, and even the adjoining serous sacs. The lesion presents the anatomical characters of a simple rather than of a specific inflammation of the lung; whereas, as I have elsewhere tried to show, the word "specific" fitly describes the anatomical characters of the lesion in acute lobar pneumonia.[1]

The name "capillary bronchitis" is correct in so far as it indicates the serious involvement of the bronchioles. But I do not think that it is satisfactory because it does not sharply enough distinguish the disease which we are considering from ordinary bronchitis, and it gives no indication of the involvement of the other elements of the pulmonary tissue. Besides, it implies the opinion that the disease necessarily begins in the bronchial tubes, and while I am not prepared to say that it does not I think that there is at least a fair probability that in some cases the infection may be carried by the arteries.

These are the critical remarks which I desire to make as to the nomenclature of this interesting and far too common and fatal disease of infancy. I have not arrived at these views hurriedly. During my whole career of 15 years as a practical pathologist my attention was constantly being directed to the matter, and in 1899, on the invitation of the Glasgow Southern Medical Society, I formulated my views as a contribution to a discussion on the subject. On that occasion I was not so clear as I am now on the misleading tendency of the word "pneumonia" as applied to the disease which we are considering; and while I am well aware of the danger of attempting to upset a fairly settled nomenclature I would venture to suggest that the term "acute infantile broncho-pneumonitis" would designate all the phenomena involved more correctly than either of the three names I have been discussing.

ETIOLOGY.

The acute broncho-pneumonitis of infancy may be classified as primary and secondary. As Goodhart points out, the primary form is more liable to occur in infants; beyond the age of infancy the disease is more likely to be secondary.[2] The truth of this statement is supported by our first two cases, in which the patients were aged respectively nine and 15 months, and in which the disease was apparently primary; in the third patient, aged one year and 10 months, the disease was secondary to measles. Among the exciting causes of the primary form chill from exposure to cold is certainly one of the most powerful. It may cause the disease in quite healthy infants, but is perhaps more likely to do so in those who are weakly or have been suffering from a bronchial cold or from gastro-intestinal catarrh. The association of acute broncho-pneumonitis in infants with acute gastro-intestinal catarrh and diarrhœa is a circumstance which has been frequently insisted upon by writers on the diseases of children. In the first and third of our cases there was marked looseness of the bowels under observation in the ward, and in one of them "green diarrhœa" at a previous date had been very troublesome. In the first case the post-mortem examination revealed catarrh of the stomach and intestines and congestion of the Peyer's patches. In the second case the gastric mucous membrane was reported to be healthy and there had been no evidence during life of gastro-intestinal catarrh. Catarrh of the stomach and bowels must therefore be regarded as a powerful predisposing cause or a frequent associated condition, unless, indeed, the intestinal disorder is itself brought about by the same influences which cause the acute broncho-pneumonitis.

Of secondary acute broncho-pneumonitis whooping-cough, measles, and diphtheria are probably the most frequent antecedent states; and on the whole such secondary cases are perhaps properly to be regarded as complications or sequelæ. Perhaps, too, such forms of broncho-pneumonitis are more likely to be subacute or chronic in their course than the primary forms, and many of them terminate in tuberculous conditions.

This is all that need at present be said as to the clinical aspects of the etiology; as to the infective agent we must appeal to the bacteriologist.

BACTERIOLOGY.

Mr. McCrorie, bacteriologist to the infirmary, made cultures from the organs of the two cases in which post-mortem examinations were made and reported as follows:—

Case 1.—The spleen yielded a pure culture of Fraenkel's pneumococcus. The inflammatory exudation from the inflamed pleura and pericardium yielded cultures of pneumococci and bacillus coli communis. *Case 2.*—Cultures from the pleural exudation yielded no growth. The spleen gave pure cultures of the pneumococcus of Fraenkel. Pus from the bronchial tubes contained the pneumococcus and tubercle bacilli.

Two observations do not count for much in a complicated question such as that now before us, but it is worthy of note that in both cases the pneumococcus of Fraenkel was obtained by a skilled bacteriologist. The presence of the bacillus coli communis was so unusual that Mr. McCrorie was inclined to think that its presence was, perhaps, due to contamination in the course of the necropsy; but allowing for such a possibility the presence of the colon bacillus in the pleural and pericardial exudations is at least interesting and suggestive in view of the remarks I have just been making as to the association of acute broncho-pneumonitis and gastro-intestinal catarrh.

According to Ashby and Wright[3] the commonest micro-organism found is the Fraenkel-Weichselbaum diplococcus—i.e., Fraenkel's pneumococcus. In the septic pneumonias following measles, scarlet fever, and diphtheria various organisms are found, among others the staphylococcus and streptococcus pyogenes. "But," they conclude, "it seems exceedingly probable that there are several micro-organisms which, if the conditions are favourable, are capable of giving rise to inflammation of the lungs." With this remark I am in perfect agreement, especially as I think that we cannot regard the acute broncho-pneumonitis of infancy as in any sense a specific disease—i.e., as one due to a single specific microbe.

I cannot, however, leave the discussion of the bacteriology of acute broncho-pneumonitis without directing your attention to a very important paper by Dr. Henri Meunier entitled "Dix cas de Bronchopneumonies infantiles dues au Bacille de Pfeiffer (Influenza Bacillus)."[4] As the result of a long and most carefully controlled bacteriological research Meunier concludes that among the numerous microbic agents capable of infecting the respiratory system in infants we must include the influenza bacillus. In certain cases it would seem to have been the only organism present, at least in the earlier stages, and its presence renders the lungs more liable to the infectious influence of other organisms. The prognosis of influenza cases depends above everything upon

[1] The New York Medical Journal, August 10th, 1901, p. 249; also Glasgow Hospital Reports, vol. iii., 1901.
[2] The Diseases of Children, sixth edition, p. 315. London, 1899.
[3] The Diseases of Children, fourth edition, p. 361. London, 1899.
[4] Archives Générales de Medécine, 1897, vol. i., p. 129, et seq.

this tendency to mixed infection, which must always be carefully guarded against. We have here, then, the demonstration of another important element in the bacterial etiology of acute infantile broncho-pneumonitis and another proof in my opinion that the disease is not caused by one (specific) but by many micro-organisms.

The discovery of tubercle bacilli in the bronchial tubes of the second of our cases is also of the greatest interest in its bearing upon the well-known tendency of many cases of acute broncho-pneumonitis to terminate in chronic pulmonary tuberculosis.

MORBID ANATOMY AND HISTOLOGY.

Of the naked-eye appearances, which were demonstrated to you on the post-mortem table, and the main facts of which have been recorded in Dr. Workman's reports, the most striking feature was that the inflammatory lesion was not confined to one part of the respiratory apparatus. The inflammatory change was not limited to the bronchial tubes, as in simple bronchitis, or to the pulmonary alveoli and pleura, as in acute lobar pneumonia. In both of our cases the inflammatory process had almost equally invaded all the structures of the lungs, the tubes, the peri-bronchial tissue, the alveoli, the interstitial tissue, and the pleural membrane. In one of them it had likewise spread to the pericardium. As to the minuter details of the naked eye appearances I need not further direct your attention—this is rather the duty of my colleague Dr. Workman in his demonstrations on morbid anatomy—but for the sake of my argument I am anxious to insist upon the universal character of the inflammatory lesion and thereby to impress upon you what I think the bacteriology of the disease also indicates—the fact that in acute infantile broncho-pneumonitis we are dealing with a simple rather than a specific inflammation of the lung.

Under the microscopes on the tables I have placed for your inspection a series of sections from Case 1 prepared by Dr. Walter K. Hunter, my *chef de clinique*, and these sections will also, I think, clearly demonstrate to you the widespread character of the inflammatory process. The sections have been made from the consolidated apex and the base of the right lung and from the "small areas of collapse" in the left lung. Under one microscope a bronchiole has been placed. You will observe that its epithelium has desquamated and blocked the tube. The submucous tissue is infiltrated with leucocytes and round about there is a most intense peri-bronchitis. A second microscope shows the condition of the pulmonary tissue in the neighbourhood of such a bronchus, and this can only be described as a very acute interstitial pneumonitis. These are the characters of the central parts of the consolidated areas. Under a third microscope you will see the marginal parts of the consolidated area; here, in addition to the interstitial changes, you will observe a catarrhal proliferation going on in the alveoli, although nowhere is this a very marked feature. A fourth microscope shows the consolidated apex of the right lung. Here almost all trace of pulmonary tissue is lost in the intense proliferation of leucocytes and connective tissue corpuscles that has occurred, so that at some points we have almost the appearances of abscess formation. Under a fifth microscope you will see that the "small areas of collapse" in the left lung are in reality small areas of interstitial pneumonitis, lying immediately beneath the pleura and in immediate association with blocked bronchioles. The last microscope shows the intense fibrinous pleuritis at the base of the right lung. In fact, the microscopes demonstrate a most intense inflammatory process involving all the structures of the lungs, and justify the use of the name "broncho-pneumonitis" in the sense I have already suggested. I have no doubt that had it been possible, as I fully intended, to have made a microscopic investigation of the parts in the second case, very similar histological changes would have been discovered.

HÆMATOLOGY.

In all the cases the blood was examined, and in each several differential counts of the blood corpuscles were made by my resident assistant, Dr. Scott. The details of these examinations I have already read to you, and I now merely desire to point out that in all the cases a leucocytosis was demonstrated. In the first two cases the leucocytosis was not great but was quite distinct. In the third case the number of leucocytes was so excessive as to excite special attention. So careful was Dr. Scott to avoid error in this case that he asked one of his colleagues, Dr. R. Ramsey, who has also had special experience in blood examinations, to make an independent examination. Dr. Ramsey arrived at the same result as Dr. Scott; indeed, he made the number of leucocytes somewhat greater. In addition to their excessive number Dr. Hunter pointed out to me that some of the leucocytes presented peculiarities in their staining reactions on being examined in blood-films, but into this aspect of the case I need not enter. What the significance of this very intense leucocytosis in the third case may be I am quite unable to say, but the fact was so remarkable that I showed the blood films at a recent meeting of the Glasgow Medico-Chirurgical Society, without, however, eliciting any further information as to its import. For our present purpose, however, the fact of a leucocytosis being present in all three cases is the important clinical fact, especially as all the cases terminated fatally. It is believed by some observers that a leucocytosis, especially if at all marked, is of favourable import as regards prognosis, but our present observations do not confirm this opinion.

SYMPTOMATOLOGY, DIAGNOSIS, AND COMPLICATIONS.

It is unnecessary that I should dwell very long upon this aspect of our subject. The clinical features and the physical signs are well known and have perhaps been sufficiently described in the clinical reports which I read to you at the beginning of the lecture. One or two general remarks upon the symptoms and diagnosis, however, will form a fitting conclusion to the present exposition. Acute infantile broncho-pneumonitis is usually sudden in its onset. The infant may have been weakly or suffering from a bronchial catarrh or a cold in the head; but when the more serious disease begins the symptoms at once assume a more urgent and grave character. High fever sets in and the child soon becomes prostrate. The change in the breathing is very striking, the respirations being very rapid and laboured, and the alæ nasi dilating actively with every inspiration. The cough may not be very urgent; sometimes it is suppressed, sometimes frequent, but generally not very vigorous or paroxysmal. Very often coincidently with the onset of generalised pulmonary inflammation there is disturbance of the function of the bowels, usually showing itself by diarrhœa, occasionally by constipation and tympanitic distension of the abdomen. Marked cyanosis or pale lividity soon sets in and the little patient is either listless and drowsy or languidly restless. The physical signs are often rather indefinite and, on the whole, it must be admitted that the general condition of the baby to which I have just been referring is not infrequently of more value in the diagnosis of acute infantile broncho-pneumonitis than the signs made out on examination of the chest. There may or may not be generalised bronchial wheezing, but what does catch the ear on auscultation is the sound of sticky, medium, or fine crackling or subcrepitant râles on inspiration, which though fairly generally distributed tend to linger more persistently in particular areas of the lungs. Sometimes small patches of dulness are detected at various points, some of which may be of such extent as to suggest a lobar pneumonia or a pleural effusion. There may, however, be no dulness at all. The state of the infant is, as a rule, critical from the first and the prognosis is almost always grave.

As regards diagnosis, probably the chief diseases from which we must distinguish acute infantile broncho-pneumonitis are acute bronchitis, acute lobar pneumonia, and acute pleural effusion. In acute bronchitis the child is generally not so ill, the expression not so languid, the cough is more forcible and paroxysmal, the râles both dry and moist are of a more bronchial type, and there are no areas of dulness. Acute lobar pneumonia may be very difficult to distinguish but may be recognised if the signs on percussion and auscultation are definitely limited to one lobe of the lung. Often, however, it will only be at the crisis, which occurs about the seventh day, that we can be sure of our diagnosis. The prognosis of acute lobar pneumonia in an infant is probably more favourable than that of acute broncho-pneumonitis. In cases of acute broncho-pneumonitis, where the areas of dulness are large and situated at the base, it may be very difficult to be sure that we are not dealing with a pleural effusion. It may be necessary to use the exploring-needle, and even that may not suffice if the exudation be solid and fibrinous, as in our second case. But

perhaps the precise distinction does not matter very much in the earlier stages, especially if I am right in supposing that a pleural inflammation of a severe kind may simply be part of the general pneumonitis, as I certainly think it was in our first two cases.

One of the chief complications of acute infantile broncho-pneumonitis is empyema, though manifestly its presence implies that the child has to some extent rallied or even recovered from the earlier stages of the initial disorder. It is quite clear to me that in both of our cases had the children lived a few days longer the thick fibrinous masses in the pleural cavities would have been converted into pus. Empyema should always be suspected if the febrile symptoms show no tendency to abate after a week or 10 days, if dulness persists over a single spot, and if with some alleviation of the more severe general symptoms an irregularly remittent type of fever sets in accompanied by sweating. When pus has formed and has been found in the pleural cavity the case should be dealt with surgically at once and usually such cases do well. Another complication of acute broncho-pneumonitis is chronic pulmonary tuberculosis, but this only requires to be mentioned. Occasionally symptoms of acute meningitis manifest themselves towards the end, and sometimes, as in acute lobar pneumonia, death occurs with a temperature steadily rising into the region of hyperpyrexia, as in our third case.

TREATMENT.

I shall conclude this already too long lecture by making some very brief remarks upon the general principles which should guide our treatment of acute infantile broncho-pneumonitis.

Not the least important point in the treatment is the prophylaxis. It is to be remembered that every common cold or bronchial catarrh or gastro-intestinal disorder in a young infant may pass into the exceedingly severe and fatal disease of which I have been speaking. It is obvious, then, that everything should be done to prevent such an occurrence. No indisposition of the kind I have indicated in an infant should be regarded lightly, and the child should be carefully treated and not lost sight of till all symptoms of these initial disorders have passed away. In particular the mother should be warned of the danger of exposing the child to cold and of the necessity of keeping him or her warmly, though not heavily or tightly, clad; and gastro-intestinal derangements should be corrected by careful directions as to diet.

In the presence of the acute disorder itself the most important point to bear in mind is the fact that we are dealing with an acute generalised inflammatory disease of the respiratory apparatus, the immediate tendency of which is to produce great exhaustion of the vital powers. The disease is very essentially one of debility and treatment should aim at maintaining nutrition and stimulating the failing heart. All measures tending to depress the child should be strictly avoided and for this reason emetics are not to be used. Place the child in an airy room well warmed, and if it can be easily managed let the air near his bed be moistened by the steam from a bronchitis kettle. You will find that this will often have a marked effect in soothing the cough. Do not load him with clothes but keep him warm and avoid compression of the chest and abdomen by flannel binders. Two or three plain linseed poultices in the course of the 24 hours applied back and front and not too hot are often of service as mild counter-irritants. Feed the child by milk diluted or peptonised and check diarrhœa by subnitrate of bismuth, combined if necessary with one or two grains of Dover's powder. Alcoholic stimulants are almost always necessary, but they should be strictly supervised by the medical practitioner, ordered by him as occasion demands, and prescribed as Sturges[9] recommends—in minims, not in drachms. A mixture containing from half a grain to a grain of carbonate of ammonia and two minims of tincture of digitalis in each dose, made up with syrup, may be given every three or four hours. The child should be constantly watched by a competent nurse and should occasionally be held up to relieve breathing.

These, it seems to me, are the general principles which should guide our treatment of this very fatal disease of infancy.

[9] The Clinical Journal, June 6th, 1894, vol. iv., p. 93.

OCCLUSION OF THE LATERAL SINUS AND INTERNAL JUGULAR VEIN AN ESSENTIAL PART OF THE METHOD EMPLOYED BY NATURE, AND BY THE SURGEON IN IMITATION OF NATURE, FOR ARREST OF ACUTE GENERAL INFECTION HAVING ITS ORIGIN WITHIN THE TEMPORAL BONE.[1]

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IT has been said of the speech of Burns "that it was distinguished by always having something in it" and that "always when he did speak it was to throw new light upon the matter." "I know not," adds Carlyle, "why anyone should ever speak otherwise."[2] When I received an invitation from your secretaries to open a discussion on the surgical principles which should be our guide in the operative treatment of an acute septic process arising in the temporal bone, with special reference to the question of operation on the vena jugularis interna, these words came into my mind and I asked myself how I could best conform to their standard. In presenting to you the fruit of personal observation and reflection I hope at least to avoid "matter needless of importless burden,"[3] for men will listen "to any Sermon or Sermo when it *is* a spoken Word meaning a Thing, and not a Babblement meaning No-thing."[4]

There can be no question that there is a wide divergence of opinion on the subject before us. This was impressed upon me during a flying visit which I made last summer, in the pleasant and instructive company of Dr. Barkan of San Francisco, to the otological clinics of Körner, Lucae, Trautmann, Jansen, Schwartze and Grunert, Barth, Politzer, and Bezold. In one clinic the vein was always tied, in another it was never tied, in a third it was not dealt with unless symptoms persisted after the temporal bone operation had been carried out, and in yet a fourth it was strongly urged that the lateral sinus and internal jugular vein should be slit open for the whole extent occupied by infected clot, even should this mean an operation extending from the torcular to the subclavian. No one, I think, will contradict the statement that in Great Britain a like divergence of opinion prevails.

> "'Tis with our judgments as our watches: none
> Go just alike, yet each believes his own."[5]

There are few of us, I take it, who have not been present at an operation during which the question has earnestly been asked: Shall I tie the jugular?

> "Heaven from all creatures hides the book of Fate."[6]

And the surgeon—

> "His wit all see-saw between that and this,"[7]
> "Hangs between: in doubt to act or rest,"[8]

and trembles lest the momentous choice which is required of him "may end or mend"[9] the life of his patient. I, not less than each of you, have felt the pressure of this responsibility and conceive it to be your wish that the position should be frankly stated, and so,

> "Without offence or with, to friends or foes,
> I sketch your world exactly as it goes."[10]

Differences of practice in matters of detail are advantageous

[1] A paper prepared as an introduction to the discussion on the Indications and Contra-indications for the Ligation of the Jugular Vein in Lateral Sinus Pyæmia at the annual meeting of the British Medical Association held at Manchester, August 1st, 1902.

[2] Carlyle: The Hero as Man of Letters.

[3] Troilus and Cressida, Act I., Scene 3.

[4] Carlyle: French Revolution, vol. ii., Book III., Chapter vii.

[5] Pope: Essay on Criticism.

[6] Pope: Essay on Man, Epistle I.

[7] Pope: Epistle to Dr. Arbuthnot.

[8] Pope: Essay on Man, Epistle II.

[9] The Winter's Tale, Act II., Scene 3.

[10] Byron: Don Juan, canto viii., v. 89.

and tend to progress, but chaotic views as to the bearing of surgical principles must lead to disaster and to death.

Want of agreement among serious surgical workers in a grave question of surgical treatment arises either from the lumping together of clinical conditions having an essentially different pathological basis or from the essential pathological conditions being not clearly understood. All true and lasting surgical practice is based upon pathology and when once the pathology of an affection is clearly appreciated divergence of view as to its treatment ought to disappear.

Where is now the discussion as to the indications for operation in strangulated hernia, ovarian tumour, or even appendicitis? The operation now before us has for its object the prevention or the arrest of acute septicæmia or acute pyæmia occurring as a further consequence of septic processes which have already begun in the temporal bone. The principle upon which the operation is based—namely, the occlusion of the main venous channel leading from an infected area—is not simply one of local application to the temporal bone. It would be good practice, for example, to obstruct the deep femoral vein in septicæmia having its origin in acute necrosis of the femur.

In this paper I propose to discuss, not details of cases, but fundamental principles, and it therefore appears to me to be of the first importance to survey the position from the widest standpoint of surgical knowledge and practice.

> "The Universal Cause
> Acts, not by partial, but by general laws."[11]

And

> "Of all the causes which conspire to blind
> Man's erring judgment and misguide the mind"[12]

there is none so common amongst us mortals as that lack of judgment that:

> "Still makes the *whole* depend upon a *part*."[13]

The surgeon's

> "very eyes
> Are sometimes, like his judgments, blind;"[14]

for

> "something, sure, ...
> Hath puddled his clear spirit; and, in such cases,
> Men's natures wrangle with inferior things,
> Though great ones are their object."[15]

Septicæmia and pyæmia, which arise from infection of parts of the body other than the temporal bone, may present various clinical varieties: (1) a fulminating general process without active inflammation at the seat of inoculation, as in acute septicæmia resulting from a puncture made at a post-mortem examination without the occurrence of abscess in the finger which was pricked; (2) a fulminating general process with signs of inflammation at the seat of inoculation; (3) cellulitis rapidly spreading from the site of local inoculation with signs of violent general infection, as in acute traumatic gangrene; (4) acute local suppuration in bone with septic thrombosis of the venules, the infection being carried from these into the general circulation, as in acute osteomyelitis; and (5) infection from without of a local chronic suppuration, the pus putrefying and causing subsequent general infection, as in the cases of necrosis after amputation so commonly seen before the antiseptic era.

SOME REMARKS ON VENOUS INFECTION.

When the general infection is very acute it seems that the circulation must be primarily involved in the infection.[16] A clear statement of this important pathological fact was made by the ghost of a fatal case of aural septicæmia:—

> "And in the porches of mine ears did pour
> The leperous distilment; whose effect
> Holds such an enmity with blood of man
> That swift as quicksilver it courses through
> The natural gates and alleys of the body,
> And with a sudden vigour it doth possess
> And curd,.....
> The thin and wholesome blood."[17]

Why is general infection uncommon from a finger prick? Because the infective particles do not find a ready way into the general circulation but are dealt with by the cellular tissue. In slight wounds capillaries rather than venules are punctured. Moreover, the superficial veins of the limbs run a long course before joining the large deep veins, and their valves are sites at which septic matter is not seldom arrested. Why is general infection so common a result of septic infection of the uterus after child-birth? Because there is a ready way into veins of large calibre, with but little protective cellular tissue intervening. An illustration of the disastrous effects of sudden access of septic material to the general circulation is afforded by the violent septicæmia which occasionally follows operations involving the opening up of old and septic sinuses. Again, unless the local anatomical conditions are specially favourable to the infection gaining the interior of a large vein, infected blood from a local infective area is largely diluted with pure blood before reaching the heart. Even with large collections of pus, as in empyema, unless the pus becomes putrid a considerable time usually elapses before the patient is seriously threatened with general infection. Varying virulence of the infection can only be judged of by its effects. Independently of the nature of the micro-organism the manner of inoculation may influence the result. "Sinus-phlebitis is most frequent in streptococcus otitis. All infective agents which may give rise to otitis may on occasion cause a pyæmia spreading therefrom, but are only exceptionally observed in proportion to streptococci."[18]

The distinction of septic infection from septic intoxication is not often required; it is important, however, to bear it in mind. A few years ago I published a case of lateral sinus sapræmia which bears this out.[19] Brieger refers to cases of toxæmia and goes on to say: "Eulenstein saw such a case of acute pyæmia in which metastases were absent, caused by mural sinus-thrombosis; continued fever of several days' duration was alone present with sudden death in collapse, apparently a purely toxic effect."[20]

Free circulation of the infective agents in the blood-stream is the essential condition of general infection. This may be a primary result of the initial inoculation or may occur secondarily after local effects have been produced. The explanation of these differences is not clear. A quite similar phenomenon occurs in certain of the acute specific fevers.

In acute general infection coagulation of the blood in a large venous channel is not a common occurrence. It is indeed accidental in the sense that its occurrence depends, as a rule, on the spread of inflammation from the primary source of infection to the wall of the great venous channel. In acute suppuration surrounding a large vein the vein is seldom affected, tension of pus and direct entry of small veins into the large vessel being absent, and the lymphatic sheath barring the infection of the venous wall. For example, the internal jugular vein does not usually become thrombosed as a result of angina Ludovici. The conditions are the exact opposite in suppuration surrounding the lateral sinus; the pus is under great tension, there is abundant opportunity for small infection, and there is no lymphatic sheath. In osseous tissue generally direct venous infection is more likely to occur than in soft tissue, but nowhere do veins from bone enter a large venous channel after a shorter course than in the temporal bone, and this, I think, constitutes a special source of danger.

From much that has been written on the subject it might be thought that thrombosis of the lateral sinus or jugular vein is a necessary step in the development of septicæmia or pyæmia from temporal bone disease. This is not so; the occurrence of thrombosis is here an accidental phenomenon due to the peculiar anatomical relation of the lateral sinus and the jugular bulb to the temporal bone, which has no exact counterpart in the rest of the body. The lateral sinus being situated in a groove in the bone itself, in close proximity to, and in intimate connexion with, the diseased area, becomes involved in the local septic process and thrombosis results. The sinus thrombosis is really a *protective measure* and when the clot remains uninfected it is successful.[21] The thrombus, however, may become infected and the disease will then

> "Break out into a second course of mischief."[22]

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[11] Pope: Essay on Man, Epistle IV.
[12] Pope: Essay on Criticism.
[13] Ibid.
[14] Cymbeline, Act IV., Scene 2.
[15] Othello, Act III., Scene 4.
[16] See Muir and Ritchie's Manual of Bacteriology, page 153, and "An Experimental Investigation of Pyæmia," by Gaertner, American Journal of the Medical Sciences, March, 1902. The author produced pyæmia by introducing artificial thrombi, formed of infected pieces of cotton wick covered with gum arabic, into the jugular vein.
[17] Hamlet, Act I., Scene 5.
[18] Brieger: Verhandlungen der Deutschen Otologischen Gesellschaft auf der Zehnten Versammlung in Breslau, 1901, p. 67.
[19] Allbutt's System of Medicine, article "On Certain Affections of the Ear," vol. vii., p. 604.
[20] Brieger, loc. cit., p. 76.
[21] See some remarks by Jansen, Verhandlungen der Deutschen Otologischen Gesellschaft, 1901, p. 15.
[22] Henry V., Act IV., Scene 3.

Thus is set up an additional source of danger often of such gravity that it overshadows the primary disease.

Thrombosis occurring in a great venous channel like the sinus does not lead to its sudden occlusion. The clot which first forms in the vessel as the result of an alteration in its lining membrane lies along the wall of the vessel but does not occlude its lumen. By the addition of successive layers the clot may extend so as completely to arrest the stream of blood through the vessel. Blocking of the channel may, however, not occur in consequence of the cessation of the clotting process, or the block may fail to be permanent by reason of the contraction of the clot. From the close proximity to, and intimate connexion of the vessel with, the infective area in the bone infection of the clot occurs, so that there comes to be an additional local centre of infection continuous with the primary one, from which not only micro-organisms but gross particles of infective clot may be carried into the circulating blood. Then there is present that most dangerous condition—an infective thrombus with a but partially obstructed blood current. It is here that the surgeon may happily complete what nature has failed to carry through. In the rare cases in which septicæmia or pyæmia occurs from temporal bone disease without obvious infection or obstruction of the sinus or vein the infection has been so virulent that no local protective thrombosis has even been attempted. It is the secondary infection of the clot and *not the occurrence of thrombosis* that constitutes the danger.

Brieger appreciates the fact that thrombosis is an epiphenomenon. He says: "Such metastases without the intermediary of venous thrombosis occur in mucous membrane affections analogous to middle-ear suppurations. Such are the secondary manifestations of gonorrhœa which may be described as gonococcus pyæmia. The occurrence of this form of pyæmia without sinus thrombosis by means of purely bacterial emboli rendered probable by clinical observation is becoming unequivocally demonstrated by anatomical observations. It is especially in pneumococcus otitis that general infection of this nature occurs."[23] On rare occasions the blood may so teem with microbes that when clotting occurs in the sinus the thrombus may from the first be infected.

When thrombosis takes place in a large vein from the milder septic infections of the cervix uteri, though the local effects of the blocking of the venous channel are troublesome enough, there is not commonly breaking down of the clot and pyæmia, because the conditions leading to the secondary infection of the clot are for the most part wanting.

Jansen[24] explains some rare forms of rapidly fatal general septic infection by referring the path of infection to the lymphatics. If this were so, it would really be *venous infection* at *another point*, but the narrow calibre of the lymphatics and the intervention of glands along their course render it difficult to understand how general acute infection can occur by way of the lymphatic system without intermediate local effects. In these cases a local gangrenous process of bone and soft parts sets in,[25] putrid pus exudes, and the surface presents a greenish-grey appearance. "The examination of the bulb of the jugular has not always been made with such care as is needed to detect small circumscribed diseased spots in parts of the vessel wall which are only with difficulty accessible. In the cases of acute sepsis which I have observed I have found," says Jansen, "thrombo-phlebitis of the jugular in which the septic thrombus was not shut off by firm uninfected thrombus. In this particular form of septic illness such (thrombotic) processes, or only mural thrombi, alone come in question and not the common form of occlusive thrombo-phlebitis. The observations found in literature are not all beyond doubt. Whether, or how, the bulb of the jugular was examined is mostly not apparent. So there still drags the decision of the question as to how far this particular clinical type of disease really occurs without the intermediary of involvement of the sinus or jugular vein."[26] "By the pressure of an extra-dural abscess the sinus may be obstructed and the development of a thrombus brought about in a purely mechanical manner [as by an aseptic ligature which causes coagulation by inducing a proliferation of the endothelium] without any infection and without the possibility of a secondary pyæmia. The outer wall of the sinus is thin, being only the thin outer layer of the dura. The septic infective process much more readily spreads through this thin wall and reacts upon the endothelium and sinus contents than through the whole thickness of the dura. The immediate effect of an extra-dural abscess is for the most part confined to the outer layer of the dura, the sinus is thrombosed, but the brain is found still covered by the intact inner layer of the dura. The thrombosis which is caused by compression of the sinus in a purely mechanical manner may, when the focus of infection has been removed, remain uninfected. To attack such a thrombus by operation would be an error. Even contact with the needle used for paracentesis [a futile procedure in any circumstances] might infect it. The earlier pyæmia arises in acute ear infections the more probable is it that the point of departure of the general infective process is to be sought in the bulb."[27]

The small mural thrombi alleged so often to have been overlooked in the bulb are not necessarily the cause of the pyæmia. They may in some cases represent an *abortive attempt at protective occlusion*. Too much stress has been laid on the lateral sinus and the jugular bulb as the sole seat of infective thrombosis. I have had a case of pyæmia due to superior petrosal sinus infective thrombosis, without thrombosis of the lateral sinus. This point is touched upon in certain of the text-books[28] and by Jansen.[29] Brieger[30] says: "Primary thrombi arise in the superior petrosal sinus, especially from suppuration in the labyrinth, and are also observed in acute suppuration in the tympanum in scarlet fever." The size of the lateral sinus concentrates the mind too exclusively upon it, while in pyæmia resulting from disease in other regions of the body, no large vein being in near proximity to the disease, the attention is not distracted from the numerous small veins, each one of which may harbour an infective thrombus which may equally produce the disease.

The process of disease in the temporal bone and in the tissues around it is one *continuous* infective process. It is a mistake to think of the infection of the osseous, dural, and blood tissues as separate pathological entities. The differences are anatomical and physiological, not pathological. As the spread of the infection is by continuity of tissue the infection of the dura, for obvious anatomical reasons, precedes that of the blood. The march of the infection will thus be in this order: perisinusitis, sinusitis, blood infection. Infection of the blood suddenly brings into being a new factor, for it is infection of a tissue the liquid texture of which confers upon it the physiological property of constantly travelling through all the tissues of the body.

SOME SURGICAL AND PATHOLOGICAL REMARKS.

Nature's process for the prevention of general infection is sequestration of the infective material, as is shown by the formation of local abscess. Thus nature surrounds the poisoned tissues, be they in bone, in dura, or in blood (by coagulation), with an inflammatory barrier; and the surgeon, as the plan of nature for the saving of life is unfolded before his vision, learns the lesson of how, and by what means, surgical art may successfully deal with acute septicæmia and acute pyæmia. These cases have one thing in common—they are always acute. The only subdivisions we can recognise have to do with their early history and are as follow: (1) those in which the acute illness follows on and develops from a chronic suppuration, and (2) those in which the acute illness is but a further stage of a recent acute suppuration. But these differences in origin do not justify the notion that the surgical treatment suitable in the one case is not equally right and proper for the other. I contend that the principles of surgery apply in either case without modification, detraction, or alteration. Körner[31] quotes from Schwartze that "more than half of the cases of otitic pyæmia get well without ligature of the jugular, by simply opening the antrum, with or without clearing out the broken-

[23] Brieger, loc. cit., pp. 39–41.

[24] Encyklopädie der Ohrenheilkunde, von Louis Blau, Article, Septicämie Otitischen Ursprunges, p. 363.

[25] See description of case by Ballance, Transactions of the Otological Society, vol. ii., p. 37.

[26] Jansen, loc. cit.

[27] Jansen: Verhandlungen der Deutschen Otologischen Gesellschaft, 1901, p. 14.

[28] See Barr, Diseases of Ear, third edition, pp. 286, 365, and 366; and Politzer: Lehrbuch der Ohrenheilkunde, fourth edition, p. 496. "Less common paths of infection are the inflammations which spread along the internal auditory vein or the veins of the aqueduct to the sinus petrosus *inferior*"; and again: "The sinus transversus passing along the inner side of the mastoid process is most frequently attacked by the purulent inflammation; more rarely the sinus petrosus superior and inferior, the cavenous sinus and the jugular bulb."

[29] Jansen, loc. cit., p. 14.

[30] Brieger, loc. cit., p. 56.

[31] Die Otitischen Erkrankungen des Hirns, second edition, p. 79.

down thrombus in the sinus"; and he adds as a comment: "Here cases of pyæmia with and without sinus-phlebitis are confused together." I cannot but think that there is also confusion in Schwartze's statement between the cases with pyæmia and the cases which, though acutely ill, had only a local affection. Just as a patient who has pus pent up beneath the palmar fascia, though he may be acutely ill, is not necessarily suffering from septicæmia or pyæmia, so it is true that a patient with temporal bone suppuration, though acutely ill, may also be the victim of a *local rather than a general process*. This is a point upon which the surgeon's mind should be clear before he proceeds to operate. In the temporal bone there may be acute or chronic suppuration spreading from the tympanum and mastoid to the lateral sulcus without obvious thrombosis or severe inflammation of the lateral sinus and jugular vein. In such a case operation on the sinus or vein is not necessary unless there is evidence of general infection. "When a periphlebitis has been exposed we are justified in stopping the operation and awaiting the result, if the patient is not already suffering from a severe pyæmia."[32]

Even if suppuration has involved the dura mater and coagulated the blood in the sinus the opening of the local abscess in the groove or in the sinus may cure the case—i.e., if nature has provided against general infection by occlusion of the sinus. Brieger says: "Even a thin layer of a sound clot may be an efficient barrier against embolic detachment of particles. If the apparently healthy terminal portions of clot are allowed to remain suppuration may, however, occasionally arise therefrom. As I have demonstrated, not every apparently sound terminal portion of clot is really poor in bacteria. The subsequent breaking-down of these terminal portions has, however, scarcely any danger provided that there is such a free opening as to ensure the ready escape of the products of suppuration." [The danger is diminished if there is a free opening, but is it true that it scarcely exists? Do we in these cases obtain an opening which is surgically free? The danger would surely be much less if the jugular were tied.] "Certainly, if we restrict ourselves to the removal of the pus or the breaking-down clot we may overlook a spreading 'disconnected' thrombus on the far side of the sound portion. Against this the most complete clearing out of the sinus will not protect us."[33]

The sinus and vein constitute the main route by which the infective agents travel, whether thrombosis has occurred or not. If nature has placed an effectual block in the shape of an uninfected thrombus on the cardiac side of the infective focus the surgeon has been anticipated in the most efficient and effectual manner. But as Viereck[34] remarks: "Surely we should not rest content with the always doubtful evidence of occlusion which an apparently sound thrombus affords if we considered ligature (of the jugular) as entirely free from danger." It cannot, then, be true that in a given case there are indications and contra-indications for operation on the vein.

> "Nature and wisdom never are at strife."[35]

The question is as to the *exact diagnosis*, not as to the right method of treatment, for in a particular morbid condition there are not two right plans of treatment but one right plan of treatment. Yet in actual practice—

> "So vast is Art, so narrow human wit,"[36]
>
> "The lyfe so short, the craft so long to lerne,
> Th' assay so hard, so sharp the conquering,"[37]

there may be doubt as to the exact pathological condition present and then vacillation as to the course to be pursued may arise. From the experience, often dearly enough bought, of many workers certain valuable guiding principles of treatment can be with some precision formulated and much of the knowledge which has been gathered can be imparted. The divine gift of judgment

> ("For judgment only doth belong to Thee")[38]

is, however, incommunicable, but I demur to the view that the possession of this gift is confined to the select few. Pope says:

> "For if we look more closely we shall find
> Most have the seeds of judgment in their mind."[39]

We speak of some animals as being sagacious, and the sagacity of brutes is allied to the talent of instinctive judgment in men. Shakespeare might have written of brutes in a lesser degree, no doubt, what he did of mankind:

> "By a Divine instinct men's minds mistrust
> Ensuing dangers, as, by proof, we see
> The waters swell before a boisterous storm."[40]

An acute observer once said to me of one of Britain's greatest physicians, now deceased, "He was the most sagacious beast I have ever known." It is true that in times of stress and doubt some exhibit clearer insight and greater courage than others. In these the talent of judgment has been zealously nurtured. The power of seizing the moment for decisive action in the presence of disease which puts a check on the thread of life winnows out the weak from the strong in judgment:

> "The wingèd courser, like a gen'rous horse,
> Shows most true mettle when you check his course."[41]

No surgeon would mistake a local abscess of the thigh for spreading cellulitis; but the differentiation of the cases under consideration is a more difficult problem. In the thigh the whole condition is visible to the eye, but in the temporal bone a correct inference must be made of the state of parts not visible. If after the operation on the temporal bone the signs of general infection persist an error of judgment has been committed and the operation has been incomplete. It is true that the vein may now be tied and that some such cases have been successful:

> "Fortune brings in some boats that are not steer'd."[42]

But less can be expected from the operation on the vein when done as a secondary measure than when carried out as a part of the first operation.

> "Omission to do what is necessary
> Seals a commission to a blank of danger."[43]

Greig Smith said in reference to the operation for the relief of intestinal obstruction: "Let it be either drugs or operation and never that fatal compromise—operation when drugs fail."[44] "Conviction, were it never so excellent, is worthless till it convert itself into conduct."[45] So here let the surgeon be no "hovering temporiser,"[46] but let him make unflinching decision as to whether the case be one calling for operation on the vein as well as on the temporal bone and not adopt that equally fatal compromise, operation on the vein when operation on the temporal bone has proved insufficient.

> "Mistrust of good success hath done this deed.
> O hateful error."[47]
>
> "For things bad begun make strong themselves by ill."[48]

Such a compromise exhibits a stuttering state of the surgeon's belief in the efficacy of operation on the vein. "When Belief waxes uncertain Practice too becomes unsound."[49] Carlyle defines "Belief to be the healthy act of a man's mind." "We have," he adds, "our mind given to us, not that it may cavil or argue [and this is a splendid lesson to the surgeon face to face with a grave surgical emergency], but that it may see into something, give us a clear belief and understanding about something, whereon we are then to proceed to act."[50]

There may be also a fulminating general infection from the temporal bone quite comparable to the fulminating general infection from a post-mortem wound; when,

> "The life of all the blood is touched corruptibly."[51]

In these cases less can be hoped from operation on the vein or, indeed, from operation of any kind. Not much could be expected from tying the axillary vein or amputating the limb in a case of acute septicæmia from a wound of the finger. Serumtherapy and dilution of the affected blood with saline solution offer the main chance of recovery.

Chronic suppuration of the temporal bone is a more frequent cause of acute general infection than is acute suppuration. It has been remarked, and this is in accord with my own experience, that "pus forming around the sinus seems more readily to induce gangrene of the sinus

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[32] Jansen, loc. cit., p. 28.
[33] Brieger: loc. cit., p. 97.
[34] Verhandlungen der Deutschen Otologischen Gesellschaft auf der neunten Versammlung in Heidelburg, 1900.
[35] Juvenal: Satire XIV., line 321 (Gifford).
[36] Pope: Essay on Criticism.
[37] Chaucer: Canterbury Tales, The Assembly of Foules.
[38] Henry VI., Part II., Act III., Scene 2.
[39] Pope: Essay on Criticism.
[40] Richard III., Act II., Scene 3.
[41] Pope: Essay on Criticism.
[42] Cymbeline, Act IV., Scene 4.
[43] Troilus and Cressida, Act III., Scene 2.
[44] Abdominal Surgery, sixth edition, vol. ii., p. 661.
[45] Carlyle: Sartor Resartus, Book II., Chapter ix.
[46] The Winter's Tale, Act I., Scene 2.
[47] Julius Cæsar, Act V., Scene 3.
[48] Macbeth, Act III., Scene 2.
[49] Carlyle: The Hero as Priest.
[50] Carlyle: The Hero as Man of Letters.
[51] King John, Act V., Scene 7.

wall and septic infection of its contents when it has resulted from chronic suppuration in the bone than when it has resulted from acute."[52] Thus we have again an acute condition to deal with, but here superimposed upon a chronic. The acute symptoms may or may not be associated with coagulation of the lateral sinus blood. The remarks of Körner and Jansen as to the frequency with which clot in the bulb has been overlooked must be borne in mind. Jansen says: "In a case of severe septicæmia I found the upper part of the jugular vein necrosed as early as the seventh day after the first appearance of the fever and the acute influenza otitis, while the sinus was absolutely intact." He adds that "the phlebitic processes of the bulb present as a whole a graver prognosis as to systemic infection than those of the lateral sinus" and that "frequently in acute otitis the bulb is in greater peril than the sinus, especially in inflammation of extreme virulence, in delayed spontaneous perforation and under favourable anatomical conditions such as protruding jugular fossa with extended apposition of the bulb to the tympanic cavity."[53]

In spreading septic thrombosis when the blood of the sinus and vein

> "Is turned to an infected jelly"[54]

the clot may reach the subclavian or even the heart. In this class of case no doubt can arise as to the urgent necessity of operation on the vein.

Although the danger of infection by way of the blood-stream cannot be said to be averted completely unless all the blood from the infected area is arrested (and as ligation of all the veins and lymphatics is impossible this condition cannot be realised by any measure short of complete excision of the whole diseased area, which is, indeed, also impracticable), yet, as the internal jugular vein is the direct highway along which in these cases highly infected blood is reaching the heart by a short route and with little further admixture with pure blood from uninfected regions, the establishment of a block in the highway must prevent direct access of infective material and so greatly reduce the risk from the primary source.

Experience has shown the great efficacy of the operation on the vein, even though the whole of the local disease may not have been removed, as in Case 4 of my first paper.[55] It is, therefore, idle to maintain that the collateral circulation through the occipital and petrosal sinuses and the condylar and vertebral veins renders abortive the surgical occlusion of the main sinus and vein. These latter represent the wide gate and broad highway that lead to destruction, and when these are obstructed if the poison finds a new pathway to the general circulation it encounters a narrow gate and a circuitous route which retard its progress and tend to dilute its virulence.

Brieger, in a statement qualifying his recommendations for ligature, says: "It is questionable whether ligature is needed for the obliteration of the jugular or whether its obliteration may not be spontaneously brought about just as surely as by ligature through certain processes following sinus-thrombosis."[56] It might just as truly be maintained, I think, that operation should be discarded in a case of empyema, since a collection of pus in the chest may be limited by adhesions and discharge spontaneously.

It has sometimes been objected that the operation on the vein is a dangerous procedure and all sorts of bogies, such as œdema of the brain and the entrance of air, have been conjured up to throw doubt upon the wisdom and advisability of the procedure. In general surgery the jugular vein is constantly removed in order to facilitate the ablation of glandular and other tumours of the neck, and in my view the operation presents, in skilled hands, no danger and "the loss of the vein does not make the slightest difference to the patient."[57] It must be remembered that in most of these cases the operation recommended does not block a still patent venous channel but one which is already packed with septic clot and more or less impermeable. "The only objection that could be urged against the doctrine of dealing with an apparently uninfected clot in the radical way suggested is that cases not due to ear disease are known in which recovery has taken place after non-septic thrombosis of the lateral sinus, and that in these cases canalisation of the clot may occur, so as to allow of the passage of blood again along the once plugged sinus. This objection does not appear to me to have any weight, and the risk of leaving untreated a clot in the immediate neighbourhood of very virulent septic matter in the hope that it may remain uninfected seems so great that it puts out of court what is at best only an imaginary advantage—viz., the chance of the sinus becoming patent again and thus functionally useful to the patient."[58]

STATISTICS AND OBSERVATIONS OF SOME SURGEONS.

The appeal to statistics does not have so great weight with me as the matured judgment on the matter in dispute of an experienced surgeon. This is in part due to the fact that probably in most of the worst cases the jugular is tied, and secondly because in the majority of cases in literature there is no such account as will satisfy a critical examination or will justify a critical personal judgment as to (*a*) the virulence of the disease, (*b*) the local conditions found at the operation, and (*c*) the appropriateness of the measures employed by the surgeon. Nevertheless, some figures given by Viereck[59] are sufficiently instructive to quote. In 94 cases of uncomplicated thrombosis of the sinus the jugular vein was tied in 40; six died from pyæmia and 34 recovered (85 per cent.); and of these recoveries 28 (70 per cent.) were without complications and six (30 per cent.) were complicated with fever and metastases. Of the 54 cases in which the jugular was not tied 13 died from pyæmia and 41 (76 per cent.) recovered, and of these recoveries 14 only (46 per cent.) were without complications and 27 (54 per cent.) were complicated with fever and metastases. It therefore appears that ligature prevents metastases. Viereck sums up: "In ligature [of the jugular] we possess a method which prevents pyæmic infection more surely than does operation on the sinus alone, with which, therefore, it should always be combined. In order to avoid the danger of detachment of fragments of clot and of entrance of air into the vein the operation on the vein should precede that on the sinus."

VIERECK'S TABLE.

94 Cases of Uncomplicated Thrombosis of the Sinus.

—	40 with ligation.	54 without ligation.
Died from pyæmia	6—i.e., 15 per cent.	13—i.e., 24 per cent.
Cured	34—i.e., 85 „ „	41—i.e., 76 „ „
Cured without complications...	28—i.e., 70 „ „	14—i.e., 46 „ „
Recovered with fever and metastases	6—i.e., 30 „ „	27—i.e., 54 „ „

1¼ Cases of Thrombosis of the Sinus and of the Internal Jugular Vein.

—	12 with ligation.	2 without ligation.
Cured without complications	12	0
With metastases...	0	2

Brieger[60] says: "In the cases of pyæmia in which, on account of the negative result of exploration of the sinus, I have believed that mural thrombi were present, I have seen recovery occur without ligature of the jugular, although at least one of the cases was characterised by special severity, particularly on account of the number and character of the metastases." Ligation, it would appear, is most important when the sinus is not completely obstructed by clot.

At the meeting of the German Otological Congress in Breslau in 1901 Jansen, for whose judgment and operative skill I have the highest regard, read a very important paper. He stated that in pyæmia there was always a diseased sinus; in four only out of his 63 cases had he failed to prove the presence of sinus-thrombosis.[61] He recommends ligature of

[52] Jansen: Encyklopädie der Ohrenheilkunde (Blau). Article, Sinus der Dura Mater, p. 367.
[53] Jansen: Verhandlungen der Deutschen Otologischen Gesellschaft, 1901, p. 24 and 25; and Archives of Otology, 1900.
[54] The Winter's Tale, Act I., Scene 2.
[55] Ballance: On the Removal of Pyæmic Thrombi from the Lateral Sinus, Transactions of the Medical Society of London, vol. xiii.
[56] Brieger: loc. cit., pp. 102, 103.
[57] W. Watson Cheyne: Harvelan Lectures, p. 37.
[58] Ballance, loc. cit.
[59] Viereck, loc. cit. The account of the cases quoted is even more instructive than the figures from the point of view of operation on the jugular.
[60] Brieger, loc. cit., p. 100.
[61] Jansen, loc. cit., p. 35, 36.

the jugular:—1. As the first step of the operation (*a*) in undoubted cases of jugular phlebitis and (*b*) in severe sepsis. 2. After exposure of the sinus (*a*) if the sinus appears sound and there is no perisinous affection, but rigors and marked oscillations of temperature are present, and (*b*) in periphlebitis and mural thrombosis under the same conditions. The sinus should be opened (*a*) on the evidence of the presence of septic broken-down thrombus, when the result of puncture is negative; (*b*) in gangrene of the sinus wall; (*c*) in repeated rigors, marked oscillations of temperature, and poor general health; and (*d*) when optic neuritis is present, in most cases if not always. 3. After incision of the sinus (*a*) if septic thrombus is, or was, situated in the immediate neighbourhood of the bulb, and (*b*) if after the incision of the sinus the rigors do not cease or the temperature materially decrease or should other cerebral symptoms persist. Jansen's table of 50 cases is as follows. Of 30 cases without ligation 22, or 73 per cent., of the patients recovered, and of 20 cases with ligation 13, or 65 per cent., of the patients recovered. Notwithstanding Jansen's numerous successful cases which recovered without operation on the vein, yet his recommendations for operations on the jugular are so comprehensive that one can scarcely imagine a case of pyæmia which would not come within their scope.

Macewen[62] says: "Where the infective thrombus in the sigmoid sinus has undergone such extensive disintegration as is unlikely to be reached by obliteration of the upper two-thirds of the sigmoid sinus the ligature of the internal jugular is indicated. When in a thrombosed internal jugular giving the sensation of a hard cord-like structure its upper part becomes soft from disintegration of the thrombus, and when this is followed by descending disintegration, ligation of the vessel below this point is in most cases necessary. When one can foresee in the outset of the case that the vein requires to be ligatured it had better be done as the first step before clearing out the sigmoid sinus, as greater freedom may then be obtained while performing the latter. In the majority of instances the obliteration of the upper two-thirds of the sigmoid sinus is all that is necessary for the prevention of systemic infection."

Brieger[63] gives the following figures: "Out of the total of 33 cases which I have observed 26 were operated on; in 10 the jugular was tied with five recoveries and in 16 it was not tied with eight recoveries, so that the percentage was the same in both series. A critical examination of the individual cases does not materially alter the result—is, perhaps, a little more unfavourable to ligature." The important thing must be, not whether a certain number of patients recover without operation on the vein, but whether a certain number of patients die who would have recovered had the operation on the vein been done. Brieger's recommendations respecting the operation are as follow: "In my judgment the vein is to be exposed as a preliminary measure only in those cases where the diagnosis of primary bulbar thrombosis is possible with special precision; but after the exposure of the sinus the vein should be exposed in the following cases: (1) straightaway, in immediate combination with the sinus operation only when the infective process cannot be completely commanded by the operation on the sinus, or does not appear to be, by this means, made completely accessible, that is to say—(*a*) if the cardiac end of the breaking-down process cannot be reached through the open sinus; (*b*) if when the sinus is found normal there exist such local conditions as point, with some degree of certainty, to the presence of jugular thrombosis. Further experience must show whether we are justified in endeavouring to determine the permeability of the jugular by Whiting's method and by compression of the jugular in the neck, and how far the measures to be adopted should depend on the result of this investigation." [This method of investigation must be highly dangerous if there is any clot in the vessel.] "2. During the subsequent course of the case (*a*) if fairly positive signs of the extension of the sinus-thrombosis into the vein should arise; (*b*) if with a normal sinus, after the evacuation of perisinous abscesses or other foci from which mural thrombi may develop, typical fever and the occurrence of metastases persist. In all these cases the exposure is first the important thing; ligature can be combined with it if the nature of the contents of the vein allows of the immediate slitting up of the exposed portion. Here, again, also, after the exposure of the vessel ligature is to be made dependent upon local indications arising from the inspection of the exposed vein, from the alteration of its degree of distension by compression and from the examination of its contents by exploratory puncture. I sum up: 1. Sinus-phlebitis is always to be treated by operation. The presence even of severe complications or advanced metastases—meningitis, pulmonary abscess with pyopneumothorax—does not exclude the possibility of recovery. 2. The operative treatment must always begin at the primary source of infection. The clearing out of this may suffice to bring about the resolution of a pyæmia caused by mural thrombi, and it is in every case indispensable in order to obtain permanent recovery. 3. In the presence of unequivocal symptoms of primary thrombosis of the jugular bulb operation is best done on the jugular and not on the sinus. 4. Ligature of the jugular cannot entirely prevent the occurrence of metastases and is often unsuccessful when carried out as a purely prophylactic measure. 5. It should therefore only be employed upon particular indications."[64] It is worth remark that this summary begins: "Sinus-phlebitis is always"—it is not the sinus-phlebitis which requires operation, on the vein at all events, but the pyæmia.

Preysing,[65] in relation to the question of ligature of the jugular, divides the principal forms of sinus-phlebitis into three groups (here, again, sinus-phlebitis, not sinus-pyæmia): "1. Sinus thrombosis without symptoms—(*a*) quite fresh clot in the sigmoid sinus or (*b*) old occluding thrombi consisting of firm granulation tissue such as are commonly first discovered in the course of a temporal bone operation. In both cases ligature should remain undone unless subsequent complications should arise. 2. Cases characterised by clear and definite signs of participation of the jugular in the infection or definite pyæmia with metastases. Here ligature should always be done and that before the temporal bone operation. 3. Thrombi in the sinus softened in the centre but firmly shut off on both sides. In these cases ligature should be done if rigors, fever, &c., persist or arise after the temporal bone operation has been carried out, but we can wait with a clear conscience when these threatening indications are absent. If ligature must be done in this third group of cases it will naturally follow the mastoid operation; the right may, however, be conceded to every operator, if he believes he has diagnosed this third form of sinus-thrombosis, to carry out the ligature before the trephining." This is in practical agreement, when the significance of the last sentence is considered, with the advice I gave when first I wrote on this subject, that operation on the vein should be done when pyæmia is present or is threatened. The cases in Preysing's first group are obviously not pyæmia.

In the paper, written in 1889,[66] I said: "The diagnosis having been made there remains for discussion the question of treatment. This must *in all cases* be two-fold—viz., the free exposure and removal of the focus from which pyæmic infection has occurred *or is threatened*; and secondly the establishment of a block in the highway along which the infecting agents are travelling from the local focus into the general circulation. ..... With regard to the vein ..... it should certainly be ligatured *in all cases* of thrombosis of the sinus associated with ear disease; and though it may not be possible to determine whether a given thrombus be septic or not septic, yet the probabilities are so great that if the thrombus be not already infected it will become so, that it would be foolhardy in such a case not to ligature the vein ....." In the same paper I dealt with the question of pyæmia arising from the temporal bone without obvious infection of the lateral sinus and I wrote: "Under such circumstances it behoves us to inquire whether surgical interference offers any hope of life to the patient. The answer to this question is, for me at least, an emphatic affirmative. Whether the sinus be full of clot or moving blood it matters not; in either case the poison is being poured into the sinus, or, say, through the vein of the cochlea into the jugular; and the method which has proved efficacious in saving life in the one case will assuredly if promptly applied be equally successful in the other. The local disease of mastoid or petrous must be freely exposed and antisepticised with sublimate solution. The vein must be ligatured in the neck and the sinus must be freely exposed in the usual way behind the ear, opened, and plugged. Thus an artificial thrombosis of the blood

[62] Pyogenic Infections of the Brain and Spinal Cord, pp. 310, 311.
[63] Brieger, loc. cit., p. 101.
[64] Brieger, loc. cit., pp. 108–111.
[65] Verhandlungen der Deutschen Otologischen Gesellshaft, 1901, p. 118.
[66] Ballance, loc. cit.

arrested between the plugged sinus and the ligature on the vein will be effected. It will then not be possible for any further infection to happen from the primary source of disease, for the collateral circulation is not sufficient to carry the infective material down the other jugular, as is shown by the histories of the four cases on which I have operated. The whole or the greater part of the clot thus artificially induced would not at first be other than healthy in character, but it might subsequently become infected with micro-organisms, in which event it would be easy to wash it out, especially if the lower end of the upper segment of the vein had been stitched to the margins of the skin wound in the neck. By these means the surgeon may erect an effectual barrier against further pyæmic infection from the primary focus, which may at once be successful in arresting the symptoms of danger, or may materially assist a patient in combating the symptoms of acute pyæmia until the chronic stage is reached which, in this disease, is always of hopeful import so far as life is concerned." In a paper written last year for Chipault's international work, "L'Etat Actuel de la Chirurgie Nerveuse," as yet unpublished, this position is modified by saying: "Nothing is more striking to those who have had much experience in these cases than the fact that in some the process rests purely local, while in others it rapidly extends in either direction. The pathological conditions being so diverse no absolute rule can be given as to whether or not the internal jugular vein should be tied. The course to be pursued depends upon the condition found. If the suppuration in the vein is localised and the sinus occluded on each side of the area of suppuration, incision of the sinus and drainage suffices for its cure. If, however, infected clot is extending along the course of the jugular vein it is as clearly the duty of the surgeon to operate on that vein as it was his duty to operate on the original disease in the temporal bone; he must, as we have already said, follow the disease to its utmost limits." That is to say, in other words, that if when you do the operation the conditions found are such as to make it quite sure that a pure block already exists in the highway you need not make a new one. The principle of the original statement is in no way modified by this concession, since nature has then already done what would otherwise be demanded from art. Körner in reference to this question says: "The cause of the happy result of operations limited to the sinus lies in the fact that the sinus is in most such cases shut off on both sides by solid uninfected thrombi. Again most such cases are instances of early sinus-thrombosis unexpectedly found in operating for extra-dural abscess, not yet of great extent and but little broken down. ..... In most cases it cannot be known whether the thrombus has extended into the bulb of the jugular and there broken down; from this situation detachment of particles and their entrance into the blood-current can take place more easily than from the sinus. The ligature of the jugular is *justified* in all cases of sinus-thrombosis and will be *necessary* when the diseased sinus is not firmly occluded on the cardiac side. "The question is more simple if it is known that the thrombus has extended to the bulb of the jugular vein itself. Every movement of the head and every manipulation of the neck may cause detachment of particles of clot, and experience teaches us that under these conditions the occurrence of pulmonary metastases is almost constant. All authors are agreed that here the jugular should be tied and that before the sinus is opened."[67] "If a considerable flow of ichorous fluid takes places on incision of the sinus," says Jansen,[68] "it is to be inferred that the septic breaking-down process extends to the bulb, and that the bulb, if not already infected, is in immediate danger of becoming so. Under such circumstances the surgeon had best proceed forthwith to the ligature of the jugular." It is impossible, in many a case, to say that there is no reason to fear septic venous infection, and in case of doubt operation on the jugular should be performed.

"To fear the worst is oft to cure the worst."[69]

CONCLUSIONS.

1. *Diagnosis of case before or during operation.*—The surgeon, from his examination of the case, must, if possible, come to a clear determination as to the condition from which his patient is suffering—whether (*a*) from an acute systemic infection or (*b*) from a systemic disturbance depending upon a local process. When this can be determined beforehand the plan of operation is clear. If doubt exists as to the exact nature of the case the matter must be cleared up by careful observation at as early a period as possible during the progress of the operation on the temporal bone.

2. *The operation on the vein.*—This should be undertaken: (*a*) in acute pyæmia and acute septicæmia, whether the sinus is occupied by clot or by fluid blood; (*b*) if the sinus wall is gangrenous or its contents are putrefying, unless it is perfectly clear that on both sides of the area of inflammation the lumen of the sinus is completely blocked by non-infected thrombi (how seldom this qualification will be operative will be obvious to those who have most experience of these cases); (*c*) if it is proved, or even suspected, that the blood of the jugular bulb is in part or wholly clotted; and (*d*) if the jugular vein is thrombosed.

It will be seen that, in my opinion, operation on the vein is called for, not only by general systemic infection, but also by certain local conditions. Some observers hold the opinion that the decision of the question as to whether operation on the vein should be carried through depends principally upon the local conditions found, while others think that the decision should depend more upon the state of the patient in general and the febrile conditions in particular. The right course to adopt is clearly to give due consideration to all the facts.

When it has been decided to deal with the vein before beginning to operate, the operation on the vein should precede that on the temporal bone, and when operation on the vein is first decided upon during the course of the temporal bone operation, it should be forthwith carried through without waiting for the completion of the operation on the sinus region.

The vein when not thrombosed is exposed in the neck about the level of the cricoid cartilage, and the surgeon, tying its tributaries and dividing them between two ligatures, should remove it completely up to the bulb. Ablation of the vein is better than ligature. It involves ligature of the tributary veins and as the line of incision involves the external jugular that vessel is also necessarily tied. In cases of thrombosis of the internal jugular the ablation will begin at its junction with the subclavian, and it will be no difficult task in these circumstances to find on its inner side, lying on the scalenus anticus, the vertebral vein and to ligate and divide it also.

Lest it may be said that this is too desperate a measure to recommend I would say that in these cases

"Strong reasons make strong actions,"[70]

and

"The only safety lies in the despair of safety."[71]

3. *The completion of the operation on the sinus region.*—Having dealt with the vein the operator returns to the sinus region and removes bone so as to expose the sinus towards the torcular for a distance of at least three-quarters of an inch beyond the area of inflammatory change, and the same treatment is adopted on the other side of the inflamed area, bone being removed in some cases, and probably better in all, as far as the bulb, so that the whole area of possible infection of sinus and vein is exposed in one continuous wound.

In general surgery an extensive septic suppuration is treated by laying the affected area open by one or several incisions, but in those cases in which it is possible to expose the infected tissues by one incision, however long, the best results ensue. If one continuous wound is not made in cases of lateral sinus pyæmia the dangerous area of the bulb is not laid open and the presence here of even small particles of putrefying clot may determine an extension of the infective clot along the inferior petrosal sinus to the cavernous sinus, just as when a ligature has been left on the upper segment of the jugular a "test-tube of pus" may form in it and produce a similar disastrous effect. The danger of this practice was pointed out in a previous paper.[72]

Jansen[73] says that when he has reason to anticipate further suppuration in the sinus thrombus he exposes the sinus for a greater length so as to be able to extend his incision in it without the necessity for a further bone operation. This seems, however, a recommendation which is not sufficiently thorough-going, since if further breaking down of

[67] Körner, op. cit., p. 80.
[68] Jansen, loc. cit., p. 27.
[69] Troilus and Cressida, Act III., Scene 2.
[70] King John, Act III., Scene 4.
[71] Conquest of Mexico, Prescott, vol. i., p. 351, also, "Una illis spes salutis, desperasse de saluti," P. Martyr de Orbe Novo, Dec. 1st, cap. 1.
[72] Ballance: Allbutt's System of Medicine, loc. cit., p. 603.
[73] Jansen: Encyklopädie der Ohrenheilkunde, loc. cit., p. 371.

the thrombus is likely to happen further incision of sinus is required at the first operation. It is impossible to deal with the sinus as with the vein, by removal, as this would expose the intra-dural space. In acute foul suppuration of other parts of the body we do not curette away the pus and therefore the suggestion frequently found in otological literature, that we should curette away pus or putrefying clot through an opening in the sinus, is one that should be abolished from surgery. The obvious proceeding is to slit up the sinus, if necessary from torcular to bulb, so that the whole area of infective inflammation may be exposed and dressed *secundum artem*.

Brieger [74] says: "No doubt remains as to the measures to be carried out with respect to the sinus. The sinus is to be slit up in the whole extent to which it is thrombosed and the tube of the vessel is to be converted into a groove, freely exposed on its outer aspect by the excision of the entire outer wall, and its contents for this portion of its extent completely removed. The sharp spoon is not a permissible instrument for use in the sinus because, even when immediate injury is avoided, clots may be detached which are serving to shut off from the infected area neighbouring vessels, such as the petrosal sinuses, which are as yet intact. The occurrence of hæmorrhage when clearing out the sinus is not, *per se*, a proof that the removal of clot is complete. By the removal of such portions of clot as block the entrance of the petrosal sinuses sharp bleeding may occur in spite of the lateral sinus or the jugular being full of clot."

4. *Some further considerations.*—1. The radical procedure here described will, in certain cases, no doubt commend itself to all, but, as I have already pointed out, it is in the selection of cases that the judgment of the surgeon must come in. Want of proper perspective in the selection of the operation suitable to a particular case is well illustrated by the following instance: "The two practitioners in attendance had already chiselled away the mastoid a few days after the commencement of the pains in the ear, and that as far as the posterior border of its apex, for they had mistaken the posterior border of the mastoid for the linea temporalis. As they had found no pus and as the violent pain persisted and the fever was still higher after the operation in their perplexity they sought my help. I incised a boil which completely occluded the meatus, whereupon fever and pain immediately ceased. The unnecessary wound in the mastoid healed in three weeks." [75] No one would use such a case as an argument against complete removal of all disease in the temporal bone; and no one, I trust, would select the operation I have just described on the sinus and vein for the relief of a local process in the temporal bone. In dealing with a case our measures must correspond to the actual condition from which the patient is suffering.

2. It has already been shown that the surgical treatment should be the same whether the disease has had its origin in an acute or in a chronic inflammation and that the dealing with the inflamed sinus and the inflamed vein in a manner comparable to the proper surgical treatment of acute inflammation in other parts of the body by free incision or ablation is not only not dangerous but highly beneficial and curative.

3. In all great operations, in which

> "All the shrouds wherewith my life should sail
> Are turnèd to one thread, one little hair," [76]

speed is an essential factor in success and grants to the eager surgeon

> "Commandment on the pulse of life." [77]

In such an operation as I have described rapidity of skilled execution is as urgently needed as in general septic peritonitis from perforation or as in hæmorrhage from rupture of the spleen or the rupture of a tubal pregnancy. As germane to the subject of despatch in operating I may quote from a writer who in criticising an operation which had been needlessly prolonged says: "Such slowness is no result of justifiable caution but shows want of dexterity and imperfect knowledge of the operation region and the want of self-confidence arising therefrom." [78] During an operation.

> "Fearful commenting
> Is leaden servitor to dull delay." [79]

> "Away then: work with boldness and with speed,
> On greatest actions greatest dangers feed." [80]

To sum up, may I again emphasise the fact that I am profoundly convinced of the value of arresting the current of venous blood which flows from the infected area. I strongly urge its curative value, its imitation of the processes of nature, its harmlessness as an operative procedure, and its foundation on a true appreciation and knowledge of pathology. It does not appear to me to be a moot question of surgical detail but is in accord with fundamental surgical practice. The risk of leaving the vein unoccluded must not be run.

On the walls of a famous clinic is emblazoned the legend—

> "Ohne Glück und Gunst ist Weisheit und Kunst umsunst." [81]

There appears to be a hidden meaning in these words beyond that conveyed by the ordinary English translation—"Without luck and favour [grace or protection] knowledge and art are in vain"—perhaps somewhat akin to the thought expressed by the Psalmist:

> "Except the Lord build the house: their labour is but lost that build it.
> Except the Lord keep the city: the watchman waketh but in vain." [82]

From the surface meaning of the words, as applied to surgical practice, I entirely dissent. If under modern conditions a new wound heals by first intention the surgeon has but done his duty and luck and chance do not come in, but if the wound suppurates the surgeon has no justification in assigning the disaster to chance or luck. The circumstances of the operation must be carefully investigated so that the cause of the failure to obtain primary union may be discovered and that measures may be taken to avert the calamity of suppuration from future wounds.

Körner [83] says: "Experience disproves the dictum of Schwartze that for successful operation on brain abscess less depends upon method than upon luck, quite apart from the fact that there is absolutely no operation concerning which more depends upon luck than upon method."

In dealing with the lethal process of lateral sinus pyæmia and septicæmia luck and chance are poor substitutes for knowledge, skill, and determination.

> "In the reproof of chance lies the true proof of men." [84]

To you assembled here I would say—

> "Out, out, thou strumpet, Fortune: all you gods,
> In general synod take away her power." [85]
>
> "First follow Nature, and your judgment frame
> By her just standard, which is still the same:
> Unerring NATURE, still divinely bright,
> . . . . . .
> At once the source, and end, and test of Art." [86]

"Between vague wavering capability and fixed indubitable performance," says Carlyle, [87] "what a difference." The conduct of the operation, no light matter even in the more simple of the cases under consideration, in the graver instances demands a sustained mental, and indeed physical, effort, the severity of which can only be appreciated by personal experience. Too often when a patient is first seen

> "A huge infectious troop
> Of pale distemperatures and foes of life" [88]

have already wrought such havoc that

> "Life is set at a pin's fee." [89]

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[74] Brieger, loc. cit., p. 94.
[75] Körner: Die Eitrigen Erkrankungen des Schläfenbeins, p. 50.
[76] King John, Act V., Scene 7.
[77] King John, Act IV., Scene 2.
[78] Körner: Op. cit., p. 18.
[79] King Richard III., Act IV., Scene 3.
[80] Marlowe: Lust's Dominion. Act. II., Scene 2.
[81] The Otological Clinic at Halle. A friend informs me that this is an old German proverb dating from the fifteenth century. It is one of a series of old sayings inscribed on the walls of a room in the Wartburg of Eisenach (in Saxe-Weimar) and there reads,

> "Ohne Glück und Gunst
> Ist Kunst umsunst."

It, with the other sayings, is attributed to Luther, but the authorship is not considered certain. Carlyle mentions "a room in the Wartburg where Luther sat translating the Bible."
[82] Psalm cxxvii., 1, 2.
[83] Körner: Die Otitischen Erkrankungen des Hirns, &c., pp. 149 and 150. Professor Schwartze a little further on in the paper from which Körner quotes makes this statement: "Further, in so far as concerns the recovery of a case of brain abscess which has been operated upon I once more emphasise that it is always a matter of luck (stets Glückssache ist) if the operation brings about a lasting recovery."—Archiv für Ohrenheilkunde, vol. xxxiii., p. 119.
[84] Troilus and Cressida, Act I., Scene 3.
[85] Hamlet, Act II., Scene 2.
[86] Pope: Essay on Criticism.
[87] Carlyle: Sartor Resartus, Book II., Chapter vii.
[88] Comedy of Errors, Act V., Scene 1.
[89] Hamlet, Act I., Scene 4.

But, the true path of treatment being revealed,

"It beseems not [that the surgeon] shrink with common fright
Nor by the brief cold touch of fear be chilled and stunned."[90]

For it is his privilege

"To labour in his vocation"[91]

in the calm assurance that

"In man's most dark extremity
Oft succour dawns from Heaven."[92]

He must in every detail and throughout every complication fulfil his duty with a purpose as unwavering as the stream of

"the Pontic sea,
Whose icy current and compulsive course
Ne'er feels retiring ebb, but keeps due on."[93]

Till that

"The fire of life kindle again
The o'erpress'd spirits,"[94]

and,

"The organs, though defunct and dead before
Break up their drowsy grave and newly move
With casted slough and fresh legerity"[95];

or that, defeated but not dishonoured, for

"Checks and disasters
Grow in the veins of actions highest rear'd,"[96]

he perceives that the hour is at hand when from

"Such a desperate bay of death"[97]

"Labouring Art can never ransom Nature
From her inaidible estate."[98]

A NOTE ON ALBINISM, WITH ESPECIAL REFERENCE TO ITS RACIAL CHARACTERISTICS AMONG MELANESIANS AND POLYNESIANS.

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WHILE in Torres Straits and New Guinea in 1898 as a member of the Cambridge Anthropological Expedition the opportunity arose of studying a number of albinotic subjects who uniformly differed in certain characteristics from European albinos. Reference to the most authoritative records of observers in the Pacific Islands showed that these characters had been noted wherever albinism had been recorded among a Melanesian or a Polynesian population, so that it seems reasonable to suggest that the type of albinism occurring among the races alluded to is as much a racial characteristic as height, skin colour, or cephalic index. That it is less variable in different stocks of the above races than the qualities mentioned will appear when considering in greater detail its geographical distribution. It may be noted that leucoderma of an exceedingly definite type is very common throughout the whole of British New Guinea, including the Western tribe of Torres Straits who, although belonging politically to Queensland, are most certainly Papuans.

Albinism as seen among Papuans is always of the type referred to, for the choroid is never pink and the hair is more or less tow-coloured, the skin varies from a pink-white colour to that of *café au lait*, while the eye is generally greenish, hazel, or brown. The hair is no finer or silkier than in the normal Papuan and being frizzly keeps strictly to the racial type except as regards colour. With a light greenish eye there is usually associated a pinkish-white skin, certainly pinker where unexposed than that of the normal North European. The obvious expedient of calling this condition "incomplete albinism" or "partial albinism" has been avoided, since the latter term has already been applied by Ziemssen, Crocker, and others to those cases in which there is congenitally a complete absence of pigment over more or less limited areas of the body and which can only be distinguished from the far commoner leucoderma by their congenital history. Finsch,[1] who saw at Kerapunu and Bulaa (Hula) examples of the condition under discussion, at first called these individuals "*weisse Papuas*," but subsequently dropped this term and wrote of them as albinos.[2] These subjects show great intolerance of sunlight and certain albinos of this type suffered far more from photophobia than did a North European with apparently similar pigmented eyes under identical conditions. They may be noticeably duller mentally[3] and less active in their movements than their normal fellow-countrymen; they seem to possess more subcutaneous fat and their skin may feel thick and harsh.

Turning now to the geographical distribution of the condition, and ignoring for the moment my own observations, Finsch[4] met with such albinos near East Cape at the extreme south-eastern extremity of the Possession and also in German New Guinea.[5] As already mentioned he saw similar cases at Bulaa and Kerepunu in the Rigo district. While at Hatan in Dutch New Guinea D'Albertis saw "a man ..... accompanied by a son of about 25 and a daughter of about 20, both of whom were albinos; their hair whitey-brown, their eyes blue, and their skin white like that of Europeans." He afterwards met "a third daughter of the same man who was equally white."[6] Unluckily he makes no mention of the ancestors of this interesting family. At Fiji the members of the *Challenger* expedition saw "an albino boy who was perfectly white, his skin having a peculiar look, almost as if covered with a white powder in places. His eyes ..... appeared as if the iris were of a pale grey colour. His parents said he could see perfectly."[7] In 1840 the United States Exploring Expedition at Vaturun in Fiji met with an individual whose "skin was dirty white and fairer than that of a European would be if exposed to the sun; he was marked with many brown spots about the size of a sixpence or less; his hair was of the same colour as that of the natives who use lime water for cleaning it; his eyebrows and eyelashes were of a flaxen colour; ..... the iris was blue with no tinge of red."[8] Subsequently, the same expedition saw at Depeyster Island near the Ellice group two individuals the colour of whose skin was a "reddish white, the hair of a flaxen white with light blue eyes. ..... They were covered in many places with large brown freckles:[9] the other members of the family were stated to be in no way remarkable." Finsch saw at Waikato in New Zealand a Maori woman with "light blonde" hair whom he at first sight took for a European. He does not state the colour of her eyes, but while he mentions that her sight was somewhat weak, the context does not suggest that her eyes were red.[10]

Nystagmus and jerky movements of the eyes were absent in all the cases of albinism I saw in New Guinea, nor does any previous writer mention their occurrence. This may perhaps be correlated with the superior visual acuity of Melanesian albinos as compared with that of those commonly seen in this country. The visual acuity of two albinos I examined at Bulaa was above normal, being $\frac{1}{2}^{0}$ and $\frac{2}{3}$ respectively. The former of these was the one-eyed man mentioned by Finsch. Mr. Nettleship, who has very kindly looked through his old notes, tells me that almost all

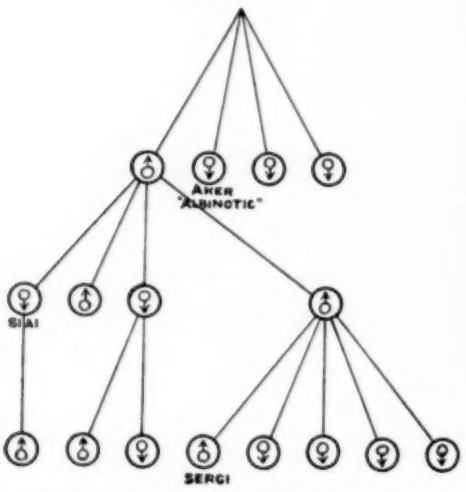
[1] Zeitschrift für Ethnologie, Band xv., 1883, p. 205.
[2] Samoafahrten. Leipsic: 1888.
[3] This was especially noticeable in the boy Kilapelama and is not very uncommon in albinos of the Caucasian race. For the two following interesting family histories, which also bear on the heredity of the condition, I am indebted to Mr. E. Nettleship, whom I take this opportunity of thanking for placing at my disposal his notes on albinos lately attending his clinic at St. Thomas's Hospital. The first is that of a female, aged 10 years. Her parents, who are both described as fair and who are first cousins, have four children, the eldest of whom, a girl, aged 12 years, has nystagmus and has suffered from fits. The next child, the patient, an albino, is dull and heavy but has not had fits. Her younger sister, aged eight years, is fair but not an albino; she cannot talk. There is also a brother, aged three months, in whom no peculiarities had been detected when the family came under observation. The second is that of a female, aged nine years. One of her maternal great-grandparents was an albino; her mother is described as almost an albino. The patient, who is "semi-albinotic" and suffers from hypermetropic astigmatism and nystagmus, is the eldest child. The next child, a boy, has been deaf and dumb from birth; two younger children show nothing unusual.
[4] Samoafahrten, p. 240.
[5] Ibid., p. 302.
[6] New Guinea. London: 1880, vol. i., p. 103.
[7] Report of the Voyage of H.M.S. *Challenger*, vol. i., p. 506.
[8] Narrative of the United States Exploring Expedition, 1838–42, vol. iii., p. 214.
[9] Ibid., vol. v., p. 41.
[10] Zeitschrift für Ethnologie, loc. cit.

[90] Faust, Part II., Act III. Passage translated by Carlyle. See Goethe's Helena.
[91] Henry IV., Part I., Act I., Scene 2.
[92] Scott: Lord of the Isles, canto I., stanza 20.
[93] Othello, Act III., Scene 3.
[94] Pericles, Act III., Scene 2.
[95] Henry V., Act IV., Scene 1.
[96] Troilus and Cressida, Act I., Scene 2.
[97] King Richard III., Act IV., Scene 4.
[98] All's Well that Ends Well, Act II., Scene 1.

his albino patients were amblyopic and had nystagmus, but that one albino—a man, aged 28 years—had a visual acuity of nearly $\frac{2}{3}$—i.e., he could read, say, three out of 10 letters in the appropriate test-type at six metres. This man's moustache was nearly white, his hair was very light, and his irides were blue-grey. His eyes, which were said to have been even lighter during childhood, yielded a red reflex by daylight and by focal illumination—that is, they were characteristically albino. There was no photophobia or nystagmus, but these were elicited by ophthalmoscopic examination.

As in other races albinism among Melanesians occurs in special families and groups of families.[11] Sometimes it is hereditary, as the following genealogical tree (Fig. 1) obtained at Yam in Torres Straits indicates. This is, however, the only instance I have been able to find in which the most marked type of albinism among Melanesians has been described as affecting more than one generation (Fig. 1).

FIG. 1.

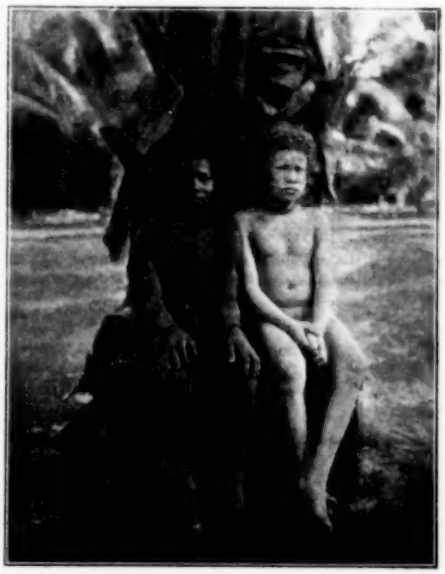


Pedigree chart showing albinos. In this chart the individuals represented in each generation are probably not given in their correct order of birth.

The above scheme may almost certainly be taken as correct, for although Sergi's putative father does not belong to this albino family there is little doubt that Sergi does. Siai and Sergi were seen; Aker—who is dead—was described as having been very light-skinned, though not a typical albino, and as having been affected with marked leucoderma beginning about puberty.

Siai, who was judged to be about 25 years of age, had tow-coloured hair and eyebrows, her eyelashes were a trifle darker, while her axillary hair—in the normal native of a deep brown-black—was light tow-coloured. The colour of her skin[12] generally was about midway between No. 5 and No. 6 in the chart given in "Notes and Queries on Anthropology," that of her face was rather yellower, probably from the effects of exposure to the sun, and, perhaps owing to the same cause, felt somewhat coarse and harsh to the touch. The palmar surface of her hands and, to a less degree, the plantar surface of her feet, were remarkably pink, more so than is usually the case in white women. When seen she was suckling; her nipples were pinkish, their areolæ being rather darker, but both lighter than in many Anglo-Saxon brunettes. Her irides were of a very light brown and photophobia did not seem to trouble her. Her nephew, Sergi, aged about seven years, had hair, eyebrows, and eyelashes of the same colour as his aunt's. The eyelashes were somewhat unusually long and curved upwards towards their free end. His body and forehead were covered with short very fine white hair. The skin of his face was rather lighter than that of No. 5 in the chart above referred to, the skin on his body was darker and less yellow

FIG. 2.



Kilapelama and normal Bulaa boy (from a photograph by the late Mr. A. Wilkin).

FIG. 3.

Kilapelama and normal Bulaa boy (from a photograph by the late Mr. A. Wilkin).

[11] Crocker (Diseases of the Skin, 1893) says: "Heredity is the only known cause of the complete form, and this in the shape of family prevalence, as where there are several children in a family more than one are almost sure to be albino, and Lesser knew of a family where six out of seven were albinos." Dr. E. Stainer, who has collected from literature the history of 61 European albinos, tells me that these cases, 37 of whom were male and 24 female, occurred in 19 families. In nine families brothers and sisters only of the observed albino were albinos, in five families other relatives were albinos, while in the remaining five families isolated cases appeared without any family history. In New Guinea, of 14 albinos seen by Finsch, D'Albertis, and myself, 10 were male and four female. They occurred in nine families; in two of these brothers and sisters were affected and in five individuals only, while in the remaining two the condition absent in brothers and sisters appeared in the next generation.

[12] The Yam women, being Christians, wear a loose dressing-gown-like garment which incidentally protects the body from sunburn.

than that of his face. His irides were light brown. He, too, did not seem to suffer from photophobia.

An albino boy, named Kilapelama, aged about 10 years, seen at Bulaa on the south-east coast of British New Guinea, had, with a light, greenish-brown iris, an especially pink-white skin covered with short, fine, almost downy white hairs. Scattered over the whole of the body there were a number of irregularly circular patches of dark pigment, varying in size from that of a split pea to that of a sixpenny bit (Figs. 2 and 3). The periphery of a certain number of these showed irregular dendritic processes of pigment. On drawing the finger over the skin no difference in texture could be perceived between the general surface and the pigmented patches; the latter, which were, if anything, rather darker and more bronzed than the skin of a normal Bulaa man, seem to be of the same character as those seen in the Vaturua case described by the American Expedition. Mr. Norman H. Hardy has given me a photograph he obtained in Sydney of the head and upper half of the body of a man of Aoba in the New Hebrides in whom the black spots are so numerous as to produce a speckled appearance; the colour of the hair is not recorded, but judging from the photograph it was not of the usual black colour. Other instances of the same condition have been described by Finsch. They were observed at Bulaa and in his paper already alluded to full details of Bulaa and Kerepunu albinos will be found.

There exists also a somewhat less-marked type of albinism in which greenish eyes and tow-coloured hair accompany skin of a pale *café-au-lait* colour. Two examples of this condition were seen at Jokea in the persons of a boy about 18 years of age and his paternal uncle. They were both lean, muscular, active, and energetic and the boy was of rather unusual intelligence. Neither suffered from photophobia to any marked degree nor was their skin harsh or thickened to the touch. This form would seem to denote a transition to those individuals not uncommon among the Papuans of Torres Straits in whom the skin is a shade or two lighter than is normally the case, their eyes being brownish and distinctly lighter than the normal dark colour. Their hair, too, is less dark and in the men this may be specially obvious in regard to their moustaches. The condition tends to be hereditary; all the children born to a Mabuiag couple, both members of which were of this type, were specially light-coloured.

Partial albinism is rare. Only one case was seen and in this, contrary to general experience, there was marked symmetry on the two sides of the body. The case was that of a Sinaugolo boy, aged about four years (Fig. 4), on whose trunk there was a large white patch; there was another somewhat diamond-shape flare on his forehead reaching on to the hairy scalp where the hairs were white. There were almost symmetrical patches just above the elbows on the back of the arm, while on both legs there were white areas extending from just above the ankles to the mid-thigh. Dotted about these there were a few small roughly circular areas of normally black skin. There was no family history of albinism of any grade or of any unusual skin condition. My thanks are due to Mr. A. C. English, Government Agent of the Rigo district, who kindly photographed this case for me. The heaped-up ulcer on the abdomen is the remains of a yaw tubercle.

FIG. 4.

Partial albinism in a Papuan boy.

Leucoderma, which, as already stated, is remarkably common and is generally distributed throughout New Guinea and Torres Straits as in other localities, tends to be symmetrical and is a disease of middle and advanced life. The borders of the white patches are always sharp and the bleaching is not as a rule preceded by an increased deposit of pigment. In one case only—that of an old woman, one of the very few natives still left on the island of Nagir in Torres Straits—was the skin at the edges of, and between the pale patches on, the hand and forearm distinctly darker than over the rest of the body. In all cases which were seen the disease was limited to the limbs, beginning always at the distal extremities and spreading slowly upwards, seldom reaching higher than the middle of the tibia in the lower limb or than the middle of the upper arm in the upper limb. The disease attacked the dorsum of the foot and the flexor surface of the wrist or hand far more commonly than the plantar and extensor surfaces respectively and very commonly began accurately opposite the flexure of the wrist, thence spreading up and down the limb. In no case could any alteration of sensation or any trophic change be detected in the affected areas, nor was there any evidence of the change being due to vegetable parasites.

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PERSISTENT HEREDITARY ŒDEMA OF THE LOWER LIMBS.

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I HAVE recently had under my care in St. George's Hospital a brother and a sister (patients of Dr. H. Hollis of Wellingborough) who were both the subjects of a peculiar form of œdema of the legs. The œdema was permanent as long as they led an ordinary life and got more marked after exercise or a warm bath, but disappeared after rest in bed for some days. It was only troublesome from the weight and size of the swollen legs and did not give rise to pain or to any other bad results. The mother, aged 45 years, who had suffered for 35 years from the same condition, had long ceased to think of her own legs and was only concerned for her children. There were five other children, both older and younger, but they were not subject to swollen legs or to chilblains. None of the mother's brothers or sisters survived infancy and this condition, which had apparently been transmitted from the mother to her two children, could not be traced any further. There was no history or trace of syphilitic infection in any of the patients. Some years ago a fatty tumour had been removed from one thigh of the mother by Mr. A. A. Bowlby. There was no evidence of hæmophilia. The œdema was limited to the lower extremities and chiefly to the legs and feet. It varied, as already pointed out, gradually increasing when the patients were up and slowly receding when they remained for some days in bed, but there was no sudden appearance of the swelling as in angio-neurotic œdema. When the limbs were kept warm the skin was natural in colour, but the circulation was very feeble, pressure on the skin leaving an anæmic area for a much longer time than in normal persons. The œdematous skin pitted fairly readily and was distinctly cold to the touch. In appearance the skin was quite free from any structural change; there was no thickening such as is seen in elephantiasis. The absence of any such change in the mother in whom œdema had existed for 35 years was remarkable. There was no tenderness on pressure over the swollen parts. There was no puffiness of the face, hands, or any part of the body except the lower extremities.

No recognised cause for œdema was forthcoming in any of the three patients. Examination of the heart showed nothing abnormal and there was no anæmia; in fact, in both the brother and sister the number of red blood corpuscles was 5,800,000 per cubic millimetre. The urine was healthy; there had been no hæmoglobinuria, and no signs of pressure on the inferior vena cava, or of lymphatic obstruction, venous thrombosis, or peripheral neuritis could be found. They had not been out of England and had never had erysipelas, and they were not subject to urticaria or to any gastro-intestinal disturbance such as is common in angio-neurotic œdema. There was, however, evidence of what was popularly called "a feeble circulation." At birth they were both "blue children," and were very subject to chilblains, both the feet and hands readily getting livid by cold. When the skin was in this condition it resembled the stage of local asphyxia in Raynaud's disease. The phenomena of local syncope, gangrene of the extremities, or hæmoglobinuria, had not, so far as history and observation went, occurred in these two patients. The lividity and blueness of the hands were exaggerated, as in erythromelalgia, when they were allowed to hang down, and diminished when they were elevated. But there was no pain or tenderness associated with the lividity, thus differing from erythromelalgia. Pressure on the congested skin left an anæmic area for a considerable time. The patients were healthy-looking, intelligent, thin, and perhaps a little small for their ages. A few further details may be recorded about their condition.

The girl was aged 16 years. Swelling of the legs began three years ago and had been constant except when confined to bed for a few days. When the legs had been bandaged the œdema had mounted to the thighs. On July 8th the following measurements were taken: the left calf, maximum measurement, 13½ inches circumference; the right calf, maximum measurement, 16½ inches circumference. A fortnight later, after being in bed most of the time, the right calf measured 12 inches and the left 11½ inches in its maximum circumference. The urine was healthy. The blood showed 5,830,000 red and 16,000 white corpuscles per cubic millimetre; a differential count showed a slight diminution of the polymorphonuclears and a corresponding increase in the lymphocytes. Blood-pressure at the wrist taken with Barnard's sphygmometer was 125 millimetres of mercury, or just about the normal.

The boy was aged 13 years. His legs began to swell three years ago. The œdema occupied both legs and ascended about half-way up the left thigh. On admission, on May 28th, the following measurements were taken: left calf, maximum, 12½ inches circumference; right calf, maximum, 13 inches circumference. On June 13th, after rest in bed with the end of the bed raised by blocks and treatment with ergot and digitalis in small doses, and galvanism, as practised by Sir T. Barlow[1] in Raynaud's disease, the maximum circumference of the right calf was 11 inches and that of the left was 11½ inches. The skin of the legs showed no structural change and no resemblance to elephantiasis. The creasing of the skin above the ankles shown in the photograph, kindly taken by Mr. J. W. Mercer, was due to the pressure exerted by boots. The knee-jerks and sensation were normal. On exposure to cold the extremities became cyanotic; this was exaggerated when the hands were allowed to hang down. The specific gravity of the blood was 1056 and the blood-pressure, taken when the hands were warm by Mr. Golla by Barnard's sphygmometer, was 95 millimetres of mercury, or below the normal. The red blood corpuscles were 5,800,000 and the white 16,000 per cubic millimetre, with a diminution in the polymorphonuclear and an increase in the mononuclear forms. The urine was natural. On July 22nd he unfortunately developed scarlet fever and was transferred to a fever hospital.

Treatment consisted in rest in bed with elevation of the bed, and though drugs and the application of the constant current to the œdematous legs on the lines indicated by Sir T. Barlow in Raynaud's disease were employed, position appeared to be the only thing which really had any definite effect on the œdema. Small doses of digitalis and ergot were given with the intention of improving the vascular tone.

Remarks.—The occurrence of hereditary angioneurotic œdema is well known. Osler[2] has given a description of a family in which that disease was present in five generations, and quite recently Wardrop Griffith[3] has recorded a case of hereditary angioneurotic œdema which suddenly proved fatal from acute laryngeal œdema. The cases under my care differed entirely from angioneurotic œdema and superficially present more resemblance to the œdema of cardiac disease or of chlorosis. But there is no evidence that the œdema can be referred to either of these causes. The cases appear to resemble the remarkable family described by Milroy[4] of Omaha in which

Shows persistent hereditary œdema of the feet, legs, and left thigh, and cyanotic condition of the hands. The creasing of the skin above the ankles was temporary and was due to the pressure of boots. The patient had been up for some hours before the photograph was taken in order to increase the amount of œdema.

out of 97 individuals in six generations 22 persons (12 males, seven females, and three unknown) had solid œdema of one or both legs without any special inconvenience or progressive increase in the disease. The condition was congenital except in one case, in which it developed at the age of 12 years. In one case only did the œdema disappear even temporarily. Crozier Griffith and Newcome,[5] in their paper on Types of Œdema in Infancy and Childhood, report a case which they regard as allied in some respects to Milroy's cases. In a child, aged four years, œdema of the face and left leg developed at three months of age after measles. Milroy, after very tentatively suggesting that the condition might depend on a congenital absence of valves in the veins, came to the conclusion that it was more closely allied to angioneurotic œdema than to any other known disease. My cases, however, differ from Milroy's in developing at or after 10 years of age. They are therefore hereditary but not congenital in addition, as were all but one of Milroy's.

[1] Allbutt's System of Medicine, vol. vi., p. 605.
[2] American Journal of the Medical Sciences, vol. xcv., p. 362, 1888.
[3] Brit. Med. Jour., 1902, vol. i., p. 1170.
[4] An Undescribed Variety of Hereditary Œdema, New York Medical Journal, Nov. 5th, 1892.
[5] Transactions of the Association of American Physicians, vol. xii., p. 411.

The disease in some respects resembles both Raynaud's disease and erythromelalgia but differs from them, as has already been pointed out, in many essential particulars.

The pathogeny of this curious condition offers a wide and tempting field for speculation. It might be suggested that the persistent tendency to œdema from gravitation depends on some inherent defect or peculiarity of the small blood-vessels, which allows excessive transudation to occur on very slight provocation. Isolated examples of œdema for which no satisfactory cause can be found come under observation from time to time. I had a case of this apparently idiopathic œdema in a healthy young woman, aged 24 years, under my care in St. George's Hospital last year, and I have heard of a few other cases in women. Œdema of obscure origin is less rare in the newly-born and in very young children and may be due to a number of different causes, but some of the cases where no satisfactory cause is forthcoming may be sporadic examples of the condition described by Milroy.

The object of this paper has been to attract attention to a definite group of cases characterised by persistent œdema of the lower extremities which is hereditary and may be congenital but does not depend on any of the factors ordinarily recognised as responsible for œdema.

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MUCIN AND MALIGNANCY: FACTS AND THEORIES.

By WILLIAM STUART-LOW, F.R.C.S. Eng.,
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No substance in the animal economy has been more despised and neglected of medical men than mucin, but it may yet be destined to become the head of the corner. Mucus has ever been the butt and *bête noir* of the physician whose every effort has always been strenuously put forth to brush, to wash, and to dissolve it away as an evil thing, serving only to harbour organisms and to retard and to jeopardise recovery from pathological conditions. How far wrong this depreciatory estimate of the value of mucin is an attentive study of its nature, functions, and probable ulterior destiny will amply bear out. Mucin is the substance that gives the sliminess to mucus. It is very largely present in the system and is found under two conditions—first, almost universally distributed as the cementing material between cells—tissue mucin. This separates connective tissue cells and endothelial and epithelial cells even where most closely approximated. Normally, there is always a layer, however thin, of muciginous material which separates the constituent cells in every tissue and membrane throughout the body; and secondly, mucin is found on all mucous membranes in mucous glands and in many epithelial and all special goblet cells, conspicuously so in the surface cells of the stomach wall where every cell is mucus secreting.

There are probably several mucins in the body. They are of a colloid nature, viscous, soluble in alkalies, but precipitable from such solutions by acetic acid. On boiling with dilute mineral acids they yield a substance which reduces Fehling's solution, and by appropriate processes mucin is broken up into a carbohydrate called animal gum and a nucleo proteid. Mucin has been specially investigated in the jelly-like connective tissue of the vitreous humour, the Whartonian jelly, and in tendons. While the part that mucin plays is doubtless largely mechanical in lubricating and protecting mucous surfaces, its peculiar chemical constitution and behaviour lend support to the belief that it has some further function. Physiologists mostly agree that mucin is not broken up in the digestive process but that it passes by the bowel unchanged. The very large amount secreted, however, and the comparatively small amount excreted would indicate that much is destroyed or absorbed in the small intestine, and the great additional supply in the large bowel supports this supposition; and further, nucleo-proteid, with its valuable percentage of phosphorus, being a result of mucin disintegration, the likelihood is that this is not thrown away but is absorbed from the intestine for ulterior use in the economy. Where mucin is found fulfilling chiefly a lubricating function as in the gall-bladder and bile ducts, in the pancreatic duct, and the lower bowel, it has a distinctly alkaline reaction and is mixed with the contents passing over the mucous surface. On surfaces bathed by acid fluids, on the other hand, the mucin is diminished in alkalinity, and in this manner it is maintained on the surface proper for protective purposes; this is well seen in the case of the urinary passages where much mucus is present and necessary. Such is a wise provision, for should the urine become alkaline the mucus present in it becomes then a serious factor in treatment. In the stomach again the acid gastric juice maintains the mucus on the surface, the protective function being paramount. On the mucous membrane of the nose and other air passages the mucus plays a most invaluable part. It maintains moisture and conserves warmth, thus facilitating sensation both common and special. It also keeps the membrane fit both to catch foreign bodies (dust, bacteria, &c.) as the air filters through and serves to secure such until the leucocytes can annihilate or remove them.

One of the most important actions of mucin and one which has hitherto been altogether overlooked is as a bactericide. This germicidal power was proved in researches I had carried out two years ago in the Laboratory of Clinical Pathology, Queen Anne-street, W., by Dr. G. L. Eastes. It was shown that mucin has a retarding influence on bacterial growth, that sterilised solutions containing mucin remained sterile for a long time on exposure to the air, and that bacteria ceased to grow in culture media when mixed with mucin. This is very interesting and instructive and proves that nature has in the secretion poured out on mucous membranes provided a ready means of suppressing bacterial growth. In the *British Medical Journal* of March 8th last there is an account (quoted from the *Lyon Medical*) of a research by Professor Fernand Arloing in which this work is repeated. From this he concludes that the mucus of red-snails has a bactericidal action on the bacillus of Löffler and other bacteria and nasal mucus was found to be a bactericide for staphylococcus and pneumococcus, but not for coli-bacteria or for Eberth's microbes. It must be evident, therefore, that mucin fulfils a potent part in the defence of the body against bacterial attack.

The essential lesion of carcinoma is the penetration of cells into the surrounding tissues, but whether this new departure on the part of the cells is a result of a cellular change or of some alteration in the intercellular resisting substance is not yet clear. The probability is that there is a certain degree of both. In old age the intercellular material undergoes a wasting change and as a result of this its resistive power against the ingrowth of epithelial cells is lessened and thus the onset of carcinoma is favoured—particularly as the overlying epithelium remains much longer active and thus there is an influence inducing the cells to penetrate inwards among the tissues. The centrosome in cells on epithelial mucous surfaces occupies that part of the cell nearest the surface and therefore the part most exposed to injury and irritation. The centrosome is the dynamic centre and plays the leading part in the division of the nucleus and the proliferation of the cell and the regulation of movement.

A study of the distribution of mucous manufacturing structures reveals the striking fact that where mucus is least abundant their malignant disease is most located. This is the case where skin and mucous membranes meet at the edges of orifices, as at the lips, prepuce, and anus; in the pharynx below the middle, as there are many fewer mucous glands in this situation than in the upper part; and on the tonsil, where there are but few mucous glands or cells even in the crypts. Malignant disease is common in the upper third of the œsophagus, where there are few mucous structures, and very common in the middle third, where there are practically none; it is least seen of any part in the lower third where mucous glands are numerous. The œsophagus is peculiar in being dependent almost entirely for its lubrication and protective coating on mucus passing down from above—from the nose and vault of the pharynx. I have observed a number of cases of malignant disease of the œsophagus and in these there has been much diminution of mucous secretion from above shown by the deficient action of the mucous membranes of the nose and pharynx and always, too, chronic dyspepsia due to the same cause—too little mucous protective coating in the stomach. Malignant disease is most frequently situated in the stomach at the pyloric end, but although there is much mucous secretion here there are special reasons for this selection; it is the most dependent part and most subjected to injury by lumpy and improperly masticated food,

and constant irritation by the acid gastric juice and from the fact that these patients are usually the subjects of deficient mucous supply from above, chronic hypo-myxia nasopharyngia et gastrica, which accounts for the diminished mucous protective coating in the stomach.

Cancer is most seldom met with of any situation throughout the whole extent of mucous membranes in the *small* intestine and in the *lungs*. As I have pointed out in previous writings,[1] there is more mucus poured into the small intestine than is to be found anywhere throughout the system; and the lungs have an abundant supply in the secretions of the lining membrane of the trachea and bronchi. The inspired air is specially cleansed during its passage through the middle of the nose, the pharynx, and larynx, so that if malignant disease is set up by irritants from without there is small chance of such gaining access in any force into the lungs. The urinary tract, again, is wonderfully exempt from cancer and mucus is plentiful on the surface lining. It is pathologically proverbial how malignant disease attacks and spreads in the mamma, but in this gland there is no mucus whatever, not even in the ducts. No protection is here necessary from irritating secretions unless the milk were to become acid from the formation of lactic acid, and lubrication is not needed as fat is the dominant element in milk. In the salivary glands how rarely is cancer encountered, but mucin is largely present in them and an element of their secretion, notably so in the submaxillary and sub-lingual. When malignant disease is met with in salivary glands the parotid with its very meagre amount of mucus is much the most frequently attacked. The exemption of tendon and cartilage and the frequency with which bone is affected are also noteworthy. The mucous glands of the uterus are mostly found in the upper two-thirds of the organ which is the least frequently affected by cancer, but I look upon a uterus prepared for carcinoma as an atrophic one or becoming atrophic just as atrophic rhinitis commonly follows on hypertrophic. The circumstance of frequent pregnancies is a strong predisposing cause. This is the hypertrophic stage in the case of the uterus, and it is at the menopause when the atrophy sets in that malignant disease comes on, when there is a hypo-myxiatous condition set up.

During the last few months I have carefully observed 15 cases of malignant disease (see below) and have been struck by the fact that all have shown evidence of hypomyxia in varying degree. I am indebted to a scholarly article by Dr. Walker Overend in THE LANCET, where he was kind enough to mention my former paper on Mucin, for

TABLE OF 15 CASES OF MALIGNANT DISEASE.

No.	Sex and age.	Occupation.	Disease.	Common salt.	Tobacco.	Syphilis.	Hypomyxia.
1	M., 56.	A "hacker of horses"; much indoors and in close rooms.	Malignant of the rectum.	Taken an excessive amount over 40 years.	Smoked cigars, cigarettes, and a pipe to excess.	Yes.	Has suffered from well-marked hypomyxia naso-pharyngea, gastrica et colica for 30 years.
2	M., 30.	Labourer with the National Telephone Company; much in dust at underground work.	Sarcoma of the tonsil.	Taken an excessive amount all his life; a great meat and bacon eater.	An ounce a day for years.	,,	Well-marked hypomyxia naso-pharyngea et gastrica et colica and a rapid eater.
3	F., 45.	Housewife; much indoors.	Malignant of the liver.	Always takes a good deal of salt.	No.	,,	Hypomyxia naso-pharyngea moderately marked, but gastrica et colica quite evident.
4	M., 69.	Worked for many years in a very dusty sugar warehouse.	Sarcoma of the left side of the pharynx with a mass of glands in the neck.	Has consumed a very large amount all his life.	At least one ounce a day for 50 years, often two.	Doubtful, but was exposed to infection in his younger days.	Hypomyxia naso-pharyngea very well marked and also gastrica et colica very evident.
5	M., 51.	Cabinet-maker; in door work and often very dusty.	Malignant of the pharynx and parotid region.	Has always taken a very large amount.	One ounce a day but often got through one pound a week.	Yes.	Hypomyxia naso-pharyngea et gastrica et colica very evident.
6	F., 45.	Housewife.	Malignant of the omentum.	Has always taken a good deal of salt and has had a ravenous appetite for shellfish.	No.	Doubtful.	Hypomyxia naso-pharyngea slightly but gastrica et colica evident.
7	M., 65.	Piano-polisher; indoor work and often very dusty.	Malignant of the œsophagus.	Has always taken a large amount of salt.	Smokes over one pound a week.	Yes.	Hypomyxia naso-pharyngea and gastrica et colica very well marked.
8	M., 68.	Indoor messenger.	Malignant of the œsophagus.	Very large consumer of salt all his life.	Smokes very large quantity.	Doubtful.	Hypomyxia naso-pharyngea well marked and gastrica et colica.
9	M., 59.	Carman on the Midland Railway; often in foul dust.	Epithelioma, glosso-epiglottidean region.	Very large amount all his life. Put it on salt bacon.	One ounce a day.	Yes.	Hypomyxia naso-pharyngea et gastrica et colica very well marked.
10	M., 35	Newsagent (dusty indoor work).	Malignant lympho-sarcoma of the cervical glands.	Had always been fond of salt with his food.	Half an ounce a day at least.	Doubtful.	Hypomyxia naso-pharyngea et gastrica well marked.
11	M., 71	Hairdresser in the city; underground and dusty.	Epithelioma, with enlargement of the glands in the neck.	Taken salt in large quantities for 50 years.	Over an ounce a day, often more, for all his working life.	Yes.	Hypomyxia naso-pharyngea et gastrica et colica very well marked.
12	M., 65	Engineer; indoors; worked in iron dust.	Malignant of the œsophagus.	Taken salt with all his food in large amount all his life.	Over one ounce a day.	,,	Hypomyxia in nose and throat and stomach well marked.
13	F., 41	Housewife; "always indoors."	Epithelioma of the tongue.	Very fond of salt and had taken it in large amount.	No.	No.	Hypomyxia in nose, throat, stomach, and bowels evident.
14	M., 28	Broker's clerk; underground dusty office.	Sarcoma of the tonsil.	Always taken salt in large amount.	Smoked nearly one ounce a day.	Yes.	Hypomyxia naso-pharyngea et gastrica.
15	M., 43	Dustman (very dusty work).	Carcinoma of the pylorus.	Taken an excessive amount of salt always.	Smoked one ounce a day for years.	,,	Hypomyxia well marked in all the usual situations.

[1] Mucin in Desiccation, Irritation, and Ulceration of Mucous Membranes, THE LANCET, Oct. 12th, 1891.

the nomenclature which here I have adopted. The term "ortho-myxia" is used to express a perfectly sound and healthy state of the mucous membranes and their secretions. Quantitative change may be termed "meta-myxia"; where the change is in excess the term "hyper-myxia" is used. The converse condition would be "hypo-myxia"; where there is a profound qualitative alteration then "para-myxia" would be most expressive. Dr. Walker Overend uses the term "myxasthenia" comparable to anæmia and to neurasthenia, and I think quite rightly, because when the local hypo-myxiatous conditions have continued long enough the state of myxasthenia is brought about. In hypo-myxia naso-pharyngia there is a history of the patient seldom or never using a handkerchief, never having occasion to blow anything from the nose, and there has in all seasons been a marked freedom from colds in the head. I have had cases where there has been irritation felt in the nose and frequent blowing induced, and still with hypo-myxia present, but these have been instances of spur or deflection of the septum or other such condition. I have usually tested the hypo-myxiatous patient by requesting a trial blow of the nose into a clean cloth, nothing being expelled or at most a little watery fluid, but never the healthy mucus that can usually be readily extruded by the ortho-myxiatous even when they happen to be octogenarians. An inspection of the interior of the nose in such hypo-myxiatous patients shows a general loss of turgescence and vascularity of the mucous lining; it may even be distinctly dry and crusts may be detected. The turbinals are small and sometimes shrivelled, especially the inferior one, and this is most noticeable on both turbinals posteriorly where most of the mucous secretion takes place. The cavity of the nose is more or less roomy. The fauces and pharynx display similar symptoms of lessened mucous discharge. Occasionally the posterior wall of the pharynx shows the para-myxiatous change in the form of streaks and tracks of altered mucus. This state of the naso-pharynx is often accompanied by a similar condition of the gullet and stomach—hypo-myxia gastrica, with its attendant symptoms of dyspepsia and flatulency, and sometimes constipation, the constipation being due to a like alteration in the large bowel—hypo-myxia colica—but this varies greatly in degree.

Now, every one of the cases of malignant disease that I refer to and made note of were hypo-myxiatous to a varying extent, and as most of these were instances of the mucous membrane of the alimentary or upper respiratory tract being affected, I am inclined to believe that there is a connexion between the two states, and that the hypo-myxiatous is a forerunner of the cancerous, especially in view of the fact that three-fourths of all cancer in man occurs in the alimentary canal.

Two features more I made out common to nearly all of the 15 cases of cancer—the first, that they were nearly all much addicted to tobacco-smoking, consuming from one to two ounces a day; and secondly, were large salt-eaters. Two of them were so addicted to salt-eating that they even had it sprinkled on salt bacon. Both of these habits tend directly to bring about the hypo-myxiatous state. The hot tobacco smoke for a time stimulates the mucous glands, but soon causes desiccation and atrophy; and excess of common salt is pernicious, because it precipitates and coagulates the mucin and causes an impairment of secretion. The essential factor in cancer being intrinsic—a weakening of the inter-cellular resistance, so that the cells when proliferating can also penetrate into the inter-cellular spaces and substance—it may be that a myxasthenia tous condition of the tissues favours, if it does not cause, this loss of resistance. Normally, as before remarked, there is always, even when reduced to a minimum, a layer of mucuginous material between cells everywhere in the body; and it is possible that this is maintained in its natural tonic resisting state by an internal circulation of muciginous matter from the intestine to the tissues. If this be so, a prolonged diminution of mucin in the alimentary tract would account for a deteriorative change upsetting the equilibrium between the cells and the inter-cellular tissues. With tissues thus prepared the effect of an injury or chronic irritation might be to determine such a morbid process as carcinoma or sarcoma, whereas in the healthy (ortho-myxiatous) these would induce no such changes, however long continued, but might cause only a harmless inflammatory action. This theory might also be made use of to explain why carcinoma is an affection of the decline of life, hypo-myxia being a senile change.

I have lately been examining a number of very old people, mostly old men. I have found them all wonderfully ortho-myxiatous, having healthy naso-pharyngeal mucous membranes, good digestion, and regular bowel action. I am inclined to believe, therefore, that such is an insurance of healthy old age. I certainly have not yet seen one healthy old man who was not ortho-myxiatous, so that one is warranted in reckoning this as a condition favouring longevity. I recently examined a man, aged 96 years, who was sent from a workhouse to the Central Throat and Ear Hospital for slight deafness and tinnitus. He expressed himself as perfectly well in every way. His mucous membranes were in good condition and all to be made out was in-drawing of the tympanum of both ears. I had no doubt that this was due to a senile change in the middle ear from desiccation of the mucous membrane, thus also accounting for the tinnitus. This was shown to be the case by the success of the treatment—viz., injection of warm mucin solution up the Eustachian tubes with markedly successful result, as his hearing improved at once and the tinnitus abated and after a few injections disappeared. This man was a non-smoker and took very little common salt. Hypo-myxia is hereditary. The tendency to a varying extent of impairment of the mucous-forming function is occasionally very evident in early life and when so it is almost always hereditary, either from one parent or both. This is most noticeable at special hospitals, as rhinitis and pharyngitis sicca and atrophica, as early as from five to seven years of age. I have notes of two cases of sarcoma in the bones of children who were both quite hypo-myxiatous, as were both their parents before them. The question arises, does this help to explain the strange and unaccountable occurrence of sarcoma in early life, and of congenital sarcoma, hitherto a baffling problem? In the following table of cases of cancer it will also be noted that in nearly every instance there was a history of syphilis. It is very remarkable how the stress of secondary syphilis mostly falls upon the mucous membrane. It is notable how many hypo-myxiatous patients have had syphilis. May this throw any light on the obscure but admitted connexion between syphilis and cancer? Cancer has been shown to be much more frequent among civilised than among savage peoples, among the denizens of town than in a rural population, and, in fact, to dog the footsteps of civilisation. This may be explained by the fact that much that is incident to town life is favourable to the development of hypo-myxia. Foul and often dusty air and bad ventilation, especially in sleeping-rooms, are some of the most noxious influences. Although it has been found to be commoner in town-dwellers, anyone with a hereditary hypo-myxiatous tendency if in unfavourable surroundings will readily become hypo-myxiatous no matter how rurally remote he may reside. The Boers might be cited as a people well known to be very liable to cancer, whose domestic sanitation is far from perfect but is most emphatically bad as regards the ventilation of their sleeping apartments. The immunity of the lower animals from cancerous processes is still unaccounted for. Wild animals are very seldom affected and our domesticated animals but rarely. It is proved that the domesticated animals most subject to cancer are not, as one might expect, the dirty-feeding pig, but those cleanly and affectionate friends and companions of man, the dog and cat. They often share with man the same unhealthy surroundings, and this doubtless to some extent explains their liability; another fact also helps to elucidate this obscure point, for the dog and cat possess much less provision for the formation of mucus than the horse, ox, sheep, and pig. Their turbinated nasal structures are excessively convoluted to enhance the sense of smell, and so mucus secretion is a subordinate factor, little or no mucin being ever formed in an olfactory region unless in very small amount. The fæces of the dog indicate but sparse mucous supply all along the alimentary canal. The horse, ox, sheep, and pig have quite an extraordinary development of mucin-forming organs.

In the horse not only are both the anterior and posterior turbinated bones very well developed, but each bone has a special fibro-cartilaginous framework extending to the external orifice of the nose. These turbinated bones are essentially so disposed as to furnish the mucous membrane of the nose with a vast surface; and such flexible appendages are sometimes double. This free surface presents numerous glandular orifices and is constantly covered by an abundance of mucus that prevents desiccation. The upper one-third

only of this larger area is devoted to olfaction. Racemose mucous glands are specially numerous on the area of the septum and the cartilaginous appendages (Chauveau). Besides this extensive secretory region soliped have another special arrangement which also subserves mucus secretion; this consists of the so-called guttural pouches, one on each side of the pharynx. They have each a length of four inches and a capacity of three-quarters of a pint. Their mucous lining is thick and vascular and very thickly studded with racemose mucous glands. Much mucus is secreted in these pouches and poured into the pharynx. Few mucous glands are present in the horse's œsophagus, but it is well lubricated and protected by the copious supply from above, as all this mucus is swallowed, for the horse never has any discharge from the nose in health. Jacobson's organ is five inches long in the horse and very thickly packed with mucous glands. The ox has also a vast development of the turbinated bones, especially of the posterior one, and besides there is an extra turbinal—the third turbinated bone of the ox. The sinuses of the head, particularly the frontal sinuses, which are very extensively developed, open freely into the meatus and afford an additional mucous secreting surface. In the pig there is also a large mucous secreting area and the turbinated bones are very prolonged. The ox is constantly licking its muffle and thus swallowing the mucus escaping from the nose and removing the humid secretion with which it is always kept damp. Chauveau in his comparative analyses of the domesticated animals gives the following table of the ratio of the area of the cranium to face: 1 in 2·69 in the horse; 1 in 3·43 in the ox; 1 in 3·24 in the pig; 1 in 1·17 in the dog; and 1 in 0·68 in the cat. Order: cat, dog, horse, pig, and ox. The face area may fairly be taken as a very good index of the mucus supply area. It will be noted that this area is much smaller in the cat and dog. The horse's secreting area is very much supplemented by the secretion in the guttural pouches.

TREATMENT.

The first patient on whom mucin was used in malignant disease was a man (Case 5) who came to the Central Throat and Ear Hospital with a large mass of glands in the parotid and cervical regions and also a hard mass bulging into his pharynx. He was suffering great pain in the throat and up the neck to the head. Mucin in the form of a gargle composed of soloid and tabloid mucin co., one of each dissolved in one ounce of hot water with a third of an ounce of lime water, gave him great relief and facilitated the swallowing of food. Mucin feeding was ordered and he was told also to swallow the gargle. He thus consumed from 10 to 12 tabloids and the same number of soloids per day. His appetite improved and his bowels—always very costive, only having an action about twice a week—soon became regular. Although his case was a perfectly hopeless one from the first he certainly improved for a time and got great relief from this treatment. The mass in the neck broke down and a large ulcerated surface resulted. This was dressed with a lotion similar to the gargle which kept the broken surface beautifully clean and sweet and greatly relieved the pain and diminished the discharges. He lived three months and was able frequently to go out, but the growth spread to the lungs and he died from pneumonia. The alleviation of the pain was certainly most marked, allowing the poor man to sleep, which he had been unable to do formerly.

The second case was that of a man (Case 11) suffering from epithelioma of the pharyngeal wall in the lower part and having a mass of glands on the left side of the neck. Mucin was ordered in a manner similar to that in the last case. The pain was again greatly relieved and he was able to sleep well and had a good appetite and his swallowing was done easily. The mass of glands diminished and at the end of one month's treatment there was a difference of two inches in the circumference of his neck. Unfortunately he contracted a severe attack of influenza and died after three days' illness.

A man (Case 2) had been under Dr. P. Abercrombie's treatment for one month at the Central Throat and Ear Hospital suffering from an induration of the right tonsil with a mass of glands in the neck. The case was going from bad to worse and Dr. Abercrombie kindly allowed me to use the mucin treatment. The growth had extended on to the soft palate and had ulcerated, the jaw was fixed so that he could only separate the teeth a very little way, and the mouth and breath were very offensive. He was also in great pain. Mucin was used as a gargle and mouth-wash and he was given mucin feeding. The improvement was very marked indeed. The pain ceased and the circumference of the neck diminished by three inches in one month (Feb. 21st last). To hasten the process I injected one quarter of an ounce of a warm solution of mucin into the subcutaneous tissue of the back three times a week and occasionally into the mass of glands in the neck. This treatment was continued for another month with good effect. The ulcerated throat cicatrised over and he could easily chew and swallow solids, so much did the jaw relax. He also gained seven pounds in weight. This favourable progress met with a check when the sites of two of the subcutaneous injections suppurated in succession. The reason for this I could not explain, as this condition had not occurred in the other cases, and every aseptic precaution was taken. One singular thing was that, although the injections into the mass of glands were conducted in the same way and with the same fluid, yet never at any time had suppuration occurred. There seemed to be a profound change in the tissues in the neighbourhood of the growth. The growth continued now to increase both inside the throat and in the neck, although the mucin still gave him great ease from pain; not until May 30th last was it necessary to perform tracheotomy. Gastrostomy was done at the same time in St. Thomas's Hospital, to which he was sent on May 28th. The mucin treatment undoubtedly checked the growth for a time. This was proved to be sarcoma by microscopic examination. The man is now home and still under mucin treatment.

Another case is that of a man (Case 4) who came to this hospital complaining of pains in the throat and up the side and back of the neck. He has a mass in the right side of the pharynx, hard and elastic, bulging into the throat and there are glands on both sides of the neck. During the last three months he has been having mucin treatment with great relief to his pain and the enlargement has somewhat lessened. His appetite has improved. He is very hypomyxiatous, but mucin spray and gargle have helped the pharyngeal discomfort, and his gastric symptoms are alleviated and his bowels are regular. He is having mucin feeding but no hypodermic injections. Dr. Dundas Grant kindly allowed me to use mucin in this case.

A man (Case 9) came to the Central Throat and Ear Hospital complaining of dysphagia, severe pain in the throat, and sleeplessness. He was found to have an epitheliomatous ulcer in the glosso-epiglottidean region, and there was a mass of glands on the left side of the neck. The mucin treatment has given him great relief and enabled him to swallow much better and to sleep at night. He is still under treatment.

Case 1 is one in which I have found mucin afford signal benefit. One month ago I did an inguinal colotomy for malignant disease in the rectum on this patient. As he is very hypo-myxiatous I had great trouble to maintain the bowels in regular action with soft stools, but mucin feeding to the extent of 12 tabloids a day—two before and two after each meal—has solved this difficulty most satisfactorily and also remedied the gastric irritation and flatulency. This is a much better means of regulating the bowels in such cases than giving oily aperients, as it supplies the natural lubricant and never causes any griping pains or too much disturbance.

These cases in which mucin was prescribed were all in an advanced stage before commencing its use, but yet there was improvement in each instance. In an early stage this improvement is likely to be better maintained, and in hypomyxiatous patients who have been operated upon for cancer it might be tried to prevent the recurrence of the disease. Of course, tobacco and salt are peremptorily prohibited.

Welbeck-street, W.

THE CANCER PROBLEM.

By W. V. SHAW, B.A., B.M., B.Ch. Oxon.,
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TUMOURS and new growths have their origin in the proliferation of tissues the cell elements of which retain most of their morphological characteristics. All newly-formed cells arise from equivalent tissue elements. This is the fundamental fact of cellular pathology. Tumour formation is a progressive process continually diverging from the

state of health It may be asked, What is the most prominent characteristic of tumour cells as opposed to normal physiological tissue? It is that their vegetative functions dominate all other functions of the cell. Their reproductive activity overpasses that in any other direction

Malignant tumours—e.g., carcinomata—are characterised by a cell-proliferation that, in its biological relations, enters into opposition with the physiological tissues from which they are derived. The more malignant the tumour in its clinical aspects the more does this proliferation and reproduction of the cancer cells become a prominent feature of the growth. This is especially seen in the peripheral growth and penetration of surrounding tissues. Another important feature of these tumours is that they never reach maturity; they are never fully-developed tissues, structurally or otherwise. Degenerations are extremely common and testify to the unstable nature of the new growth.

What, then, is the biological aspect of these conditions and what is the biological position of the cells? That the life-history of cancer cells is atypical cannot be doubted when the nuclear changes in these cells are studied. Abnormal mitotic figures are extremely common. Asymmetrical division of the nucleus is frequently observed. In certain forms of sarcoma giant cells are a prominent feature. Hyperplasia of the nucleus and hyperchromatosis of certain mitotic figures are also characteristic of these new growths. These facts point to changes in the life-history of the cells. Again, in carcinomata certain bodies have been observed in constant and close relation with the nucleus of the cancer cells. Some have considered these to be parasitic organisms causally connected with the changes referred to above. Others claim that these are degenerate portions of the nucleus or some endogenous structure formed from the nucleus. Assuming this latter explanation, these bodies give a further indication of the abnormal protoplasmic activity of the cell.

How, then, do the above nuclear changes influence the life-history of the cell? To the nucleus alone is assigned the perpetuation of the type and characteristics of the cell from generation to generation, and when any alteration takes place in the nucleus there are corresponding changes in the cell. The nucleus plays an important and controlling part, not only in the process of cell-division, but in the functional activity of the cell.

Recent experiments have shown that the stimulation of the ova of certain lowly-organised animals will cause the multiplication of cells and the ultimate development of free swimming larvæ from such ova without previous fertilisation of the ova by spermatozoa. Adult organisms do not develop, but larvæ capable of independent existence can be produced. This result has been obtained by acting upon the ova with strychnine, and also by mechanical agitation of the ova. The multiplication of cells in these larvæ is comparable with the attempts at reproduction of tissue in partially damaged structures, of which the giant cells in tubercle and the vascular connective tissue of healing wounds are examples. The growth of cancer cells is then to be looked upon as an effort of reproduction in damaged tissue, the incidence of the damage falling upon the nuclear structures. This damage alters the nature of these structures so that the vegetative functions of the cell run riot, and the cells become parasitic towards the organism in which the growth is taking place. The nature of the changes in the cancer cells and their life-history thus becomes the important point from which the origin of the cancer process must be determined.

What is the cause of this vegetative activity? Is it an initial damage to the cells in response to which there is an over-active attempt at repair? The peculiar frequency of such disease in organs once active but now undergoing involution would suggest this explanation, and also the frequent origin of malignant growths in damaged tissue further supports this view. This is in accordance with Weigert's observations on the over-production of damaged parts in the process of repair. Hence in considering the etiology of malignant growths the causation of this vegetative activity must be investigated. It may be chemical, as in the experiments with strychnine referred to above, or it may be biological, as in the theories that have been advanced as to the microbic origin of cancer. The actual epithelial cells are the source of the infective process, as shown by the reproduction of the type of cell in secondary growths, and the penetration of the surrounding tissues by the epithelial cells.

This view of the importance of the cancer cells in a malignant growth is hardly in accord with the views of those who maintain that it is the degeneration of the surrounding tissues, particularly the connective tissue, that allows of the overgrowth of epithelial cells. But such a degeneration of the connective tissue has never been clearly demonstrated as a cause; and, in the case of most cancers, there is a considerable increase of the adjacent connective tissue. This hypothesis then draws attention to the nuclear changes in cancer cells and the consequent increase in the vegetative activity of these cells.

Beckenham, Kent.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF ECTROMELUS.

BY JOHN MCGIBBON, M.B., C.M. EDIN.

THE accompanying illustration shows a female infant in whom both the upper and lower extremities are almost entirely absent It is a reproduction of a photograph taken on July 7th, 1902, the infant having been born five days previously. The stumps of the lower extremities end in fleshy nodules, but those of the upper extremities are rounded

A case of ectromelus.

as after amputation. Bones can be felt in all the stumps. The child is the fourth in the family. There is no history of shock or "maternal impression" and no trace of deformity in the other children of the family or their relatives. During the latter stages of pregnancy the mother suffered a good deal from pain in the abdomen. False labour came on and persisted for 48 hours before the os uteri relaxed, and because of this I was called to see the case by the midwife in charge. The child is healthy and vigorous. The nose is quite red from birthmark.

The case is a rare one and seems to belong to Saint Hilaire's class "Ectromélie."

Liverpool.

DEATH FROM THE BURSTING OF A TONSILLAR ABSCESS.

BY ALEXANDER LYONS, L.R.C.P. & S. EDIN.

THE following may be of interest. A man, aged 28 years, was admitted by me into the Torbay Hospital at 9.30 A.M. on August 13th suffering from a very large suppurative tonsillitis on the left side. He was given a warm bath and put to bed where he partook of a glass of milk. About half an hour afterwards the nurse in charge of the ward heard him coughing feebly and on going to ascertain the cause was surprised to find him cyanosed. She sent for me and I went immediately but the patient was dead when I arrived. I do not think that more than five or six minutes could have elapsed between the time when the nurse heard him cough and my arrival at the patient's bed-side.

At the post-mortem examination I found that the abscess had burst and that a large amount of pus had got into the upper part of the larynx.

On looking up the literature on the subject I find only one case of a similar kind recorded—viz., by Hilton Fagge.

Torquay.

A CASE OF FOREIGN BODY IN THE NASO-PHARYNX.

BY RICHARD LAKE, F.R.C.S. ENG.,
SURGEON TO THE METROPOLITAN EAR, NOSE, AND THROAT HOSPITAL, ETC.

THE presence of foreign bodies in the naso-pharynx appears to me, as far as I am able to ascertain, of sufficient rarity to justify the brief report of a case, although it is true that the symptoms did not amount to more than discomfort or inconvenience and that also in this instance the presence of the foreign body was not suspected.

The patient, a married woman, aged 48 years, was sent to me in July, 1900, by Mr. H. Beadnell Gill, who desired my opinion as to the question of involvement of any of the accessory nasal sinuses. The history was peculiar. For some years the patient had blown from the nose every morning either matter (probably muco-pus) or matter with hard offensive crusts. At times these were, according to her description, covered with mildew. The total duration of this trouble was about 14 years. On examining the patient there was obviously rhinitis sicca et atrophica and the naso-pharyngeal vault could be distinctly seen covered apparently with a crust of congealed mucus, blackish in colour. The naso-pharynx was so irritable that it was impossible to get any view from behind.

I did not see the patient again until March 3rd of this year, but when she came to see me, stating that she had a sensation of burning in the tongue, it was still impossible to get a look at the naso-pharynx. I then ordered the use of peroxide of hydrogen (10 volumes) to the vault of the naso-pharynx by means of a post-nasal syringe. Three days later a large fragment of the wing of the seed vessel of the ash or sycamore was removed from the naso-pharynx by the patient. The accompanying figure represents the piece removed.

Foreign body removed from naso-pharynx (natural size).

It is impossible to say when this foreign body was introduced into the nose and it is also equally impossible more than to speculate as to whether the inflammatory condition of the naso-pharynx was a result of its presence or whether the patient had suffered from some such condition before which had allowed of the foreign matter being more easily retained.

It is hardly necessary to state that the patient's condition has been much improved now that it is possible for remedial agents to be directly applied to the vault of the pharynx.

Harley-street, W.

A Mirror
OF
HOSPITAL PRACTICE,
BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv., Proœmium.

SIDCUP COTTAGE HOSPITAL.

A CASE OF SUPPURATIVE THROMBOSIS OF THE LATERAL SINUS; OPERATION; RECOVERY.

(Under the care of Dr. T. M. CALLENDER.)

THE treatment of the jugular vein in cases of middle-ear disease is dealt with very fully in a paper by Mr. C. A. Ballance which appears in this number of THE LANCET, at p. 795. Ligature of the jugular vein for sinus thrombosis appears to have been first suggested by Sir Victor Horsley.[1]

The patient was a man, aged 38 years. His previous health had been good. His wife had recently died from phthisis. He had three healthy children. He suffered from a "touch of the sun" six weeks before admission to hospital. On August 19th, 1901, he complained of a foul discharge from the right ear. He also complained of general weakness but there was no pain in the head or tenderness over the mastoid. The temperature on admission to hospital was 100·8° F.; next morning it had fallen to 98·2°. At noon of the following day he had a violent rigor and the temperature ran up to 105·8° and the pulse to 142. The patient became unconscious. After consultation with Dr. G. W. Davis and Mr. H. A. Duffett of Sidcup Dr. Callender decided at once to explore the mastoid and while getting ready to operate the patient was sponged with tepid water, with the result that the temperature was reduced to 102·2° and by the time he was on the operating-table he was conscious and consented to operation. A.C.E. was administered. Dr. Callender cut down on the mastoid, gouged away the bone, and found a quantity of foul pus in the cells; free communication was made between the wound and the auditory canal. The wound was douched and a gauze drain was put in. The patient seemed better for 24 hours after operation, but on the following evening his temperature was 104°. The discharge from the wound and ear was free and with cold sponging the temperature fell to normal. Next morning (two days after the operation on the mastoid) the patient had another very severe rigor and the temperature ran up to 104°. He complained of stiffness of the neck, but there was no pain or tenderness over the internal jugular and no sickness. His breath was foul. Dr. Callender resolved to operate again and to explore the lateral sinus as it was evident that the entire source of the mischief had not been reached, the rigors and foul breath which were assumed as being due to pyæmic pulmonary complications (though no definite physical signs could be made out in the lungs at this time) making the diagnosis of suppurative thrombosis of the lateral sinus probable. A.C.E. was again administered. Bone was gouged away over the lateral sinus. A hypodermic needle was thrust into the sinus and a little sero-pus was obtained, but no blood. The internal jugular vein was then cut down upon and ligatured, cutting between a double ligature. The sinus was opened freely; an opening was made in the upper end of the jugular into which was inserted the point of a No. 8 gum elastic catheter; a ligature was put round the vein and catheter to prevent escape of the contents of the vein into the wound. The lateral sinus was gently syringed from below upwards through a catheter with 1 in 4000 solution of perchloride of mercury. A large quantity of very foul pus and clotted blood came from the lateral sinus. The internal jugular vein was then ligatured above the opening made for the catheter, cut short, and the wound in the neck was closed. The lateral sinus was packed with iodoform gauze. The wound was dressed each day, douched out with 1 in 4000 perchloride, and packed with gauze. The

[1] Jacobson and Steward: Operations of Surgery, fourth edition, vol. i., p. 256.

patient improved wonderfully after the second operation, but several complications delayed convalescence. He developed a large pyæmic abscess in the back and a fœtid bronchitis. He had also an abscess in the base of the right lung which he was able to empty per mouth each morning, the expectoration being very offensive. A few tubercle bacilli were found in the sputum. Dr. Callender endeavoured to strike the abscess in the lung with an aspirating needle, without success, however, as regards reaching the abscess, but a pneumothorax developed and this, Dr. Callender presumed, by making the lung contract helped to obliterate the abscess cavity and also gave the lung rest. The patient expressed himself as feeling much better after the pneumothorax appeared, the amount of expectoration became much less and not so fœtid. An abscess formed in the wound in the neck which healed after being freely opened. Seven weeks after the operation on the lateral sinus the patient got a letter for admission to St. Mary's Hospital, London, where he was kept for a short time, and after being at a convalescent home at Ramsgate for a month he returned home in good health and able to resume his work. The facial nerve was unfortunately damaged and has not recovered its function though improvement is apparent.

Remarks by Dr. CALLENDER.—There are several points of interest in the case. 1. The few subjective symptoms; the patient never complained of pain in the head or neck. There was stiffness of the neck but no pain or tenderness. 2. Persistence of rigors and high temperature after the mastoid had been freely opened made the diagnosis of lateral sinus mischief probable. 3. The foul breath and expectoration pointed to pyæmic pulmonary complications, though at first, there being absence of physical signs in the lungs, it was thought that the foulness of the breath might be due to pus from the Eustachian tubes. 4. The improvement of the pulmonary abscess after pneumothorax had been produced was interesting.

Reviews and Notices of Books.

The Diseases of Children. By JAMES FREDERICK GOODHART, M.D. Aberd., with the assistance of GEORGE FREDERICK STILL, M.D. Cantab. Seventh edition. London: J. & A. Churchill. 1902. Pp. 813. Price 12*s.* 6*d.*

THE preparation of the seventh edition of Goodhart's "Diseases of Children" has evidently entailed a very considerable amount of revision; certain sections have, indeed, been almost completely rewritten. Among the subjects which are now added for the first time or which are so completely remodelled as almost to defy recognition those which deal with the feeding of infants, with the diseases of the nervous system, with hypertrophic pyloric stenosis, and with achondroplasia are perhaps the most important. The chapter on rheumatism has also in several notable respects been subjected to the process of revision with the result that it constitutes one of the most interesting and enlightened chapters in the book. However, we do not feel altogether convinced that a "student" will gain such a clear clinical picture of what Dr. Goodhart calls the "composite" of the disease as he would do had he to rely for his instruction on any one of the former editions. To draw a clear line of demarcation between the "status rheumaticus" and acute rheumatism has strained the intellectual resources of other authors besides Dr. Goodhart and Dr. Still, and it is instructive to follow the ingenious generalisations and circumlocutory processes whereby all direct solutions of the problem are shelved or evaded. "Children," we are told, "do indeed suffer from typical acute rheumatism, with its fever, its pain, its swellings of the joints, its sweating, but to circumscribe it (i.e., the term rheumatism) by these limits would be to ignore the larger part of the field of its workings." For the purposes of establishing a diagnosis it is suggested that we should rely on the family history and a record of small and insignificant ailments. Growing pains, skin lesions, nervous irritability, and anæmia—in fact, the same group of symptoms which certain authorities, and notably French writers, refer to the arthritic diathesis—are the hereditary conditions which, according to the authors, constitute the "status rheumaticus," and they are to be ascribed to certain inherent faults of the nervous system and to certain disabilities of nutrition. The authors admit, indeed, that the pathology of rheumatism is still a much vexed question and proceed to explain that "of late evidence has been collecting which would seem to show that it may possibly be of microbic origin." We may be quite wrong in the assumption, but after carefully reading this chapter on rheumatism we cannot help thinking that Dr. Goodhart and Dr. Still are not in absolute agreement on its essential pathology and that there have been mutual antagonisms as there have been mutual concessions. At all events, there are indications of a distinct disinclination on the part of the writers, metaphorically speaking, to burn one set of boats behind them and to abandon the neurotrophic diathesis before adequate transport of a bacteriological character has been provided; there is, in fact, a tendency to halt between two opinions.

In the chapter on tuberculosis the authors incline to the belief that infection in infancy is chiefly by way of the respiratory tract; without denying that the germs of tuberculosis do occur in milk they do not regard milk as a frequent medium of infection. However, it must be remembered that the lungs can become infected through other channels than through the air-passages, and whether lungs or bowel become demonstrably infected may be merely a question of local resistance. The alimentary tract must indeed be endowed with considerable power of resistance or from the swallowing of sputum it would almost invariably become infected in all cases of pulmonary tuberculosis. We do not think that, as far as tuberculosis is concerned, the authors have established their case against milk infection, or, indeed, against infection generally by way of the gastro-intestinal tract.

The chapter on the feeding of infants, especially with reference to that part of it which concerns the preparation of milk mixtures, is, in our opinion, altogether inadequate; and, in view of the importance of the subject, it is disproportionately short. Moreover, nearly a page of valuable space is taken up by a table which is quite useless as it stands, without instructions as to how to employ it. This table, which appears on page 47, gives in detail the percentage composition of milk suitable for the various ages of infancy and it might just as well have been omitted.

We are glad to notice that the vigorous and refreshing style which rendered former editions of the work such pleasant reading still retains its directness of expression. Although in his preface Dr. Goodhart says "he gladly '*remits*' to Dr. Still the chief responsibility for the additions and improvements," it is clear that the latter has found some difficulty in overcoming the literary troubles of dual authorship. For instance, there is no consistency in the use of the first person singular or of the first person plural and it is difficult in places to understand whether "I" means I, Dr. Goodhart, or I, Dr. Still, just as there is ambiguity about the meaning of the "we's." We do not know which author is responsible for them but we cannot help drawing attention to the following sentences and asking for a literal and literary interpretation: "The life of the child is balancing" (p. 433) and "I think that rheumatism taints more than an average of such." Again, we would ask how a new-born infant can sit up (p. 21) or how it is that the "healthiest children" are liable to show symptoms of infantile paralysis (p. 527). Might not also the frequent references to the late Dr. Sturges indicate in some way or other that this lamented physician is no longer with us? To be still further critical we would call

attention to formula 45 on p. 784. It would pass the understanding of most druggists to dispense this medicine. Ingredients which in themselves total three ounces and one drachm cannot by the addition of water be made up to three ounces only. In the treatment of chronic constipation in childhood the continued use of enemata and glycerine suppositories is favourably regarded. For our part we regard these therapeutic procedures as most objectionable. A rectum is a good rectum or a bad rectum according as its capacity for expelling its contents is physiologically normal or the reverse. If the rectum is to be trifled with by nurses using enemas and glycerine suppositories indiscriminately how can it retain its delicate sensitiveness or its powers of expulsion?

In reviewing a book so well known and so highly appreciated as Goodhart's "Diseases of Childhood" we feel confident we can in no way detract from its well-recognised merit by recording the few blemishes which a thorough and careful reading has divulged. We can, we believe, bestow no higher praise than by saying that this last edition is in all important respects superior to any of its predecessors.

Diseases of the Organs of Respiration. By SAMUEL WEST, M.A., M.D. Oxon., F.R.C.P. Lond., Assistant Physician and Lecturer on the Principles and Practice of Medicine at St. Bartholomew's Hospital; Senior Physician, Royal Free Hospital; Consulting Physician to the New Hospital for Women; formerly Physician to the City of London Hospital for Diseases of the Chest, &c. In two vols. With numerous Diagrams and Illustrations. London: Charles Griffin and Co. 1902. Vol. I., pp. 398; Vol. II., pp. 399–913. Price 36s.

THE fuller description on the title-page informs the reader that this work is "a treatise on the etiology, pathology, symptoms, diagnosis, prognosis, and treatment of diseases of the lungs and air-passages." The book is divided into sections and not chapters and the relative importance of its parts is indicated by types of different kinds. We agree with the author that such an arrangement renders reading and reference easier. It does not, however, follow that those sections which stand in small type are of little importance; they are in many cases, as in the article on Pleural Tension, of special rather than of general interest. The satisfactory plan of printing the report of clinical cases in small type is also adopted and the same type is used with matter which is added to illustrate or to explain the conclusions stated in the text.

The "introductory" section deals with the anatomy of the lungs and the physical examination of the chest. Dr. West makes some interesting remarks on two points in connexion with auscultation of the chest. All physicians connected with teaching hospitals realise the difficulties experienced by students in learning the "physical signs" connected with diseases of the lungs. This is in great measure due to the confusion of terms adopted by various writers. Some authorities use the words "bronchial," "tubular," and "cavernous" as applied to breath-sounds as synonymous terms, while others impart to them differences as regards signification which they scarcely possess. The real confusion is, however, not in facts but in words. If physicians would determine a definite nomenclature the difficulty would be lessened. Dr. West attempts to describe in words the various varieties of breath sounds and adventitious sounds. This is a difficult task, but he has succeeded well. He has, however, omitted one point which is of considerable importance—namely, the comparative pitch of inspiration and expiration. To those practitioners who possess a musical ear the observation of alteration in pitch of expiration (more particularly) is of great service in determining the variety of breath sounds. Dr. West also dwells on a second term which is a source of confusion—namely, "râles." The student who carefully studies the author's remarks will derive a clear idea of the nature and signification of adventitious sounds.

The diseases of the air-passages are next discussed and a comprehensive account is given of "respiratory obstruction." The classification of causes of obstruction to the air-tubes is both complete and practical.

We recommend Dr. West's remarks on the serum treatment of diphtheria to those who are not even yet convinced of the immense utility of the antitoxin injections. He rightly insists that in every case of diphtheria where laryngeal symptoms are present, whether pronounced or not, the serum treatment should be commenced without a moment's delay, for the success of the measure depends largely upon its being commenced in good time.

The sections on bronchitis, empyema, and bronchiectasis are all well written and thoroughly up to date. The student will also find useful information in the section dealing with "hyperæmia, congestion, hypostatic congestion and œdema" of the lungs. These terms are frequently misapplied and therefore likely to lead to confusion. The remarks on the "bacteriology of pneumonia" will also attract attention. After a brief historical review of the subject Dr. West concludes that though the pneumococcus is the pathogenic organism of the ordinary or idiopathic croupous pneumonia many other organisms also can excite an acute inflammatory infection of the lung, which so far we have no clinical means of distinguishing from pneumococcus pneumonia—e.g., the pneumo-bacillus, streptococcus pyogenes, staphylococcus pyogenes aureus, bacillus tuberculosis, bacillus anthracis, and possibly many others. We agree with the suggestion that perhaps the peculiar course which many cases of pneumonia run may depend upon the nature of the infecting germ or upon some mixed infection, and some day it may be possible to recognise these different forms of pneumonia by their clinical signs, but at present science has not progressed so far.

One of the most interesting sections in the first volume is that on broncho-pneumonia. Dr. West maintains that there are three clinical varieties of broncho-pneumonia: (1) that in which the disease is of gradual onset and preceded by some affection of the air-tubes, the course prolonged and interrupted by frequent relapses, and the termination by lysis; (2) that in which the history and symptoms are similar but the disease is of sudden rather than of gradual onset; and (3) that in which there is no antecedent affection of the air-tubes; the affection is of sudden onset and short duration, the termination is by crisis, the clinical symptoms are, in fact, those of croupous pneumonia but the lesions those of broncho-pneumonia. In other words, the secondary and primary broncho-pneumonias are clinically and pathologically different diseases; and while the secondary stands in close relation with bronchitis and similar affections of the air-tubes the primary stands in close relation with lobar pneumonia. In order to prove these contentions Dr. West examines closely the work which has been accomplished in regard to the bacteriology of broncho-pneumonia. Without entering into detail on this point we give the conclusions to which the evidence adduced points. The primary and secondary broncho-pneumonias are shown to have a different bacteriological origin. Secondary broncho-pneumonia is for the most part due to streptococcus infection, derived from some source connected with the air-tubes, throat, or mouth. It is further shown that primary broncho-pneumonia is of pneumococcal origin and that pneumococcus inflammation occurs with almost equal frequency in the child and in the adult. This second fact is not generally recognised, there being a general opinion (now shown to be erroneous) that the pneumococcal inflammation is much more common in adults than in children. The inflammation, however, takes

a different form in each—in the adult producing massive consolidation and in the child disseminated patches of consolidation. These remarks merit most careful consideration, for if the conclusions prove correct the term "bronchopneumonia" must be reserved for those affections of the lung which follow antecedent affections of the bronchi and must not include the idiopathic forms.

Volume II. commences with the subject of "phthisis." We are somewhat doubtful whether Dr. West has acted wisely in retaining this term. "Pulmonary tuberculosis" is more exact and more scientific. Dr. West defines "phthisis" as "a specific disease caused by the tubercle bacillus," and adds, "It is the commonest form of tuberculosis of the lungs, though not the only form." "Phthisis" simply means "wasting." Some authorities still maintain that there are destructive diseases of the lungs which can neither be recognised as tuberculous nor referred to any other well-known group; for such "phthisis pulmonalis" may for the present be the most appropriate name. By adopting the term "pulmonary tuberculosis" the nomenclature of tuberculous affections is more brought into line; tuberculous meningitis and tuberculous peritonitis are terms universally employed and we think that Dr. West would have done better service to nosology by heading the section "pulmonary tuberculosis" than by retaining the ancient and unscientific term "phthisis."

The description of the pathology and etiology of the disease is excellent, as is also the clinical consideration. The remarks on treatment, too, are thoroughly in accord with modern ideas. We are quite in accord with the remarks on climate; especially do we support the contention that the English climate frequently seems to fail because patients are left too much to themselves and, for the want of institutions where rules must be kept, live in their own lodgings or hotels, do much as fancy leads them, and are often most imprudent.

The sections on affections of the pleura will be read with considerable interest. Dr. West's views on intra-pleural pressure, more particularly in connexion with pneumothorax and serous effusion, are well known and the reader will find them fully discussed in this volume. The account of the clinical phenomena observed in cases of pleuritic effusion is also excellent. We are glad to observe the author's views on washing out the pleura after the pus has been evacuated in cases of empyema. Washing out the pleura is often objected to as being a risky, or even dangerous, operation. We agree with Dr. West that this is not the case. It is quite true that disastrous cases have been recorded and have been attributed actually to the washing out. Most of these cases have been instances of sudden death, but it must be remembered that death may take place suddenly in cases of pleural effusions in which the pleura has not been washed out and has not been even incised. The usual precautions must, of course, be taken to be sure that the fluid is warm and the vent free, so that the fluid may flow out readily. Some surgeons prefer to "swab out" the pleura and this procedure may be adopted without fear of danger. The volume concludes with descriptions of the rarer affections of the lungs, such as syphilis, actinomycosis, pneumonomycosis, hydatid disease, and new growths of the lungs and pleura.

In conclusion, we can speak in the highest terms of praise of the whole work. It will be found useful both by the practitioner and by the student and we can confidently recommend a perusal of it to our readers.

Trades Waste, its Treatment and Utilisation. By W. NAYLOR, F.C.S., A.M.I.C.E. With 21 Plates, 27 folding Diagrams and numerous Illustrations in the text. London: Charles Griffin and Co. 1902. Pp. 267. Price 21*s.*

THE prosperity of a country may be fairly gauged by its trades waste, but unfortunately trades waste is generally synonymous with the pollution of rivers. It cannot be gainsaid, however, that great improvement has been made during recent years in regard to the prevention of the pollution of rivers and for this desirable state of things we have mainly to thank the Rivers Pollution Commission which was appointed in the year 1867. This Commission found that the rivers were grossly polluted and it pointed out that a good deal of this pollution could be stopped and that there was no reason why it should not be stopped. Admirable, however, as the provisions of the Act may have been it is the fact that those possessing powers under this Act have not exercised them with that assiduity which in such a case was very desirable. Luckily, however, officials have been appointed to watch over the possibility of offence being committed, who, zealous for the purity of our streams and for the public health, have compelled the manufacturer to adopt some means of preventing outrage on the purity of the stream. It is satisfactory to be able to record year by year, however, that waste is a diminishing factor, appearing elsewhere as valuable material. One remarkable example is that of alkali waste. For years alkali manufacturers could do nothing with the residue from the manufacture of alkali by the Leblanc process but to dump it down in waste places until the accumulation was such that the works became surrounded by small mountains of the waste. By Mr. Chance's process this waste is now made to yield sulphur in a pure state and an inoffensive material is left instead of one which was most offensive and which yielded a poisonous yellow liquor that not infrequently found its way into rivers.

The book before us gives a number of interesting examples of the difficulties met with in dealing with trades waste and of the methods employed in the various trades to overcome these difficulties. The work is essentially one for the chemical engineer, but it is also of great interest to the economist and to the sanitarian. It is written by one who possesses great practical experience of the pollution of rivers and of the practicable means that can be adopted for its prevention. Probably Lancashire as a polluting area has been a most difficult tract to deal with. The Manchester Ship Canal, though less offensive than it used to be, is as black as ink, and the Ribble and Mersey have been notoriously maltreated by manufacturers. Mr. Naylor is the chief inspector of rivers to the Ribble joint committee and therefore he must have been face to face with some of the worst trade problems offered for solution; indeed, it is obvious from a perusal of his book that the field which he has explored is a wide one. The subjects treated comprise woollen mill waste, waste from tanning and fellmongery, brewery and distillery waste, waste from calico bleaching, dyeing, and printing, papermaking waste, and general chemical waste. Special processes of purification are fully illustrated.

We regard this book as a contribution of considerable importance not merely because it will prove a valuable and instructive guide to borough engineers, surveyors, analysts, and others, but because in setting forth clearly the causes of the pollution of rivers and the best known practical means of preventing such pollution it is calculated to assist in the attainment of a much better state of things, an end which is of the utmost concern to the whole country.

Gibson and Russell's Physical Diagnosis. Third Edition. Revised and Rewritten by FRANCIS D. BOYD, C.M.G., M.D., F.R.C.P. Edin., Assistant Physician, Edinburgh Royal Infirmary; Physician to the Deaconess Hospital. Edinburgh and London: Young J. Pentland. 1902. Pp. 448.

THE third edition of this excellent manual has been revised, and in great part rewritten, so as to bring it up to the requirement of modern medicine. Several new sections have been added describing in detail new or improved

methods employed as an aid to diagnosis. Many of these are now fully recognised and may be made use of either in the ordinary routine of practice or in the investigation of unusual cases of disease.

The chapter on the Examination of the Blood contains the results of the investigations which have recently been made in the pathology of the blood. It is now well recognised that a clinical examination of the blood is of the highest importance and will frequently afford considerable help in the elucidation of cases of doubtful diagnosis. The manner of obtaining the blood for examination is described as are the various methods which are employed in fixing and staining the films. The processes which were formerly employed to demonstrate the varieties of the white blood corpuscles were clumsy and intricate and required a long time for their completion. Now, however, the films may be rendered ready for examination in a few minutes and with a little practice may be satisfactorily employed in ordinary professional work.

Another method of clinical investigation has lately been much used, especially on the continent—namely, the investigation of the contents of the stomach. This procedure has not been largely adopted in this country owing probably to the discomfort experienced by the patient in the frequent passage of the stomach-tube. Nevertheless, in certain cases valuable information may be derived by administering a "test meal," and then after an interval drawing off the contents of the stomach and submitting them to examination. In the volume now before us brief but explicit directions are given as to the carrying out of the necessary operations.

A section has also been added on Intestinal Parasites. Directions are not given, however, as to the examination of the stools for the ova of the parasites; unless the dejecta are suitably treated these bodies will very probably be missed.

The section on the Cranial Nerves will also prove a valuable addition to the book. The description of the phenomena produced by paralysis of these nerves is clear and lucid. The symptoms are detailed in comparatively few words so that the practitioner will find this section very handy for the purposes of reference.

A short chapter is devoted to the subject of Clinical Bacteriology. It seems needless to state that the important position which bacteriology now takes in medicine renders a certain knowledge of the methods employed in diagnosis essential to the physician. The isolation and recognition of micro-organisms are, it is true, necessarily carried out in the laboratory by an expert, but the student should know how to obtain material for examination, how to examine the material when obtained, and how to stain and to recognise the commoner pathogenic organi-ms. The author wisely refrains from attempting to give a complete description of the many processes now employed in clinical work, but those more frequently required are explained. The examination of the sputum for micro-organisms is well described and a few remarks are made on the examination of the products of inflammatory exudation.

The practitioner and student will find this volume very useful for reference and study when engaged in clinical work.

Rhinology, Laryngology, and Otology and their Significance in General Medicine. By E. P. FRIEDRICH, M.D., *Privat-docent* at the University of Leipsic. Authorised translation from the German. Edited by H. HOLBROOK CURTIS, M.D., Consulting Surgeon to the New York Nose and Throat Hospital and to the Diphtheria and Scarlet Fever Hospitals. Philadelphia and London: W. B. Saunders and Co. 1900. Pp. 348. Price 10*s.*

DR. FRIEDRICH in his preface makes the pertinent remark that a speciality should not be regarded as a thing apart and a kind of appendage, but that it should take an active part in all problems in the solution of which general medicine is concerned, to do which active coöperation between general medicine and the various specialities is indispensable, and that, should this be lacking, a speciality runs the danger of becoming a mere source of revenue and of losing its scientific interest. He considers the influence of diseases of the nose, throat, and ear with those of the respiratory organs, of the circulatory system, of the digestive system, and of the blood; with constitutional diseases; with infectious diseases, acute and chronic; with diseases of the kidney; with diseases of the skin and of the sexual organs; with diseases of the eye; with intoxications; and, lastly, with diseases of the nervous system, to which he adds an appendix dealing with nasal reflex neurosis, the significance of some of the cranial nerves, and diseases of the meninges and cerebral sinuses in rhinology and otology.

Dr. Friedrich, in examining the relationship existing between the nose, pharynx, and larynx, and between them and the lungs, alludes to the most interesting experiments made by Paulson and others as to the respiratory pathways of the nose, with whose views he expresses a thorough concurrence, concluding that we are quite justified in assuming that the respiratory current passes principally through the middle and lower parts of the nose and hardly touches the interior meatus in normal conditions. Whilst discussing the action of the nasal mucosa Dr. Friedrich considers that at present we do not possess sufficiently exact proof to say more than that the nasal mucosa is not a favourable soil for the development of micro-organisms and that it does, more or less, hinder their development. He also incidentally remarks that the larynx is not entirely occluded during deglutition by the epiglottis and that the bolus of food glides easily into the œsophagus from the arched dorsum of the tongue, which guards the entrance of the larynx, an observation which is not devoid of significance with regard to that moot point, the function of the epiglottis. As regards the question of the connexion between diseases of the lungs and morbid conditions of the upper air passages he favours the views of Störk and Sticker that fœtid atrophic rhinitis in all probability bears more than a casual relationship with syphilis, that in patients suffering from this disease there is a general xerosis of the mucous membranes of the respiratory tract, and that the tendency to a dry catarrhal condition extends into the smaller bronchi. The author states that the most frequent complication of lung disease in the larynx consists of paralysis, a statement which is open to question, considering Kidd's estimate that 50 per cent. of all tuberculous patients suffer from a secondary laryngeal infection, though apart from this the statement is correct. In discussing the effects of disturbances of the normal functions of the Eustachian tube due to alterations in the upper air passages, Dr. Friedrich very truly says that the various views advanced by text-books on the conditions found in disease of the middle ear, whether due to a chronic catarrhal middle-ear inflammation or to middle ear disturbance by obstruction of the Eustachian tube, have never clearly differentiated between these two conditions, and have, in fact, only tended more to confuse matters.

The author carefully analyses the various opposing theories regarding the paralysis of the recurrent nerve, and after a very fair and impartial statement thoroughly endorses Semon's theory. In discussing secondary infection of the larynx in cases of tuberculosis of the lungs, he expresses himself in the following terms: "In view of our clinical and anatomical experience, we recognise infection of the larynx by way of the lymph channel as probably more frequent and reserve infection by contact for those cases which manifest themselves in the form of erosion

ulcers." This definite expression is particularly valuable in view of the tendency to consider infection by contact the more usual mode of infection in this disease.

Dr. Friedrich has presented the profession with a work of great interest, the value of which will be acknowledged by all scientific students of medicine. The book has lost nothing in the translation, for the language is clear and the translator has freed himself entirely from any tendency to adhere to German construction. Dr. Friedrich has a wide knowledge of diseases of the nose, throat, and ear, besides being a good general physician, and his readers cannot fail to appreciate the close reasoning that he exhibits. His book will, we trust, find its way into the hands of both general physicians and specialists in diseases of the throat, nose, and ear, for they will find much in it which will prove of value and much which is placed in a new light. We may safely say that no one can read the book without deriving a large amount of intellectual pleasure as well as extremely valuable information.

LIBRARY TABLE.

The Method of Cuignet, or Retinoscopy. By E. H. LENDON, M.A., M.D. Oxon. London: Baillière, Tindall, and Cox. 1902. Two volumes, crown quarto. Pp. 66 in the first volume; 52 in the second volume. Price 10*s.* 6*d.*—The first of these volumes contains some 66 pages of letter-press describing in wearisome detail the well-known method of retinoscopy. We cannot agree with the author that the theory of the subject is either complicated or difficult. It is fairly well described in most of the text-books on refraction and ophthalmology. Sir William Bowman used this method to discover regular astigmatism some 14 years before the publication of Dr. Cuignet's paper on "Keratoscopie" in 1873. It is to Dr. Parent's contribution in 1880 that we owe our first true explanation of the phenomenon, so that the very title seems open to criticism. We should expect in a work devoted entirely to this subject to find extreme accuracy in the details, but this is far from being the case. The author, for instance, says that if a concave mirror is used of 25 centimetres focal length and a lamp is placed 120 centimetres from it, a real inverted image of the lamp is formed at about 30 centimetres distance. It would really be formed at a distance of more than 31½ centimetres. The second volume is merely an atlas of 13 diagrams of the familiar principles of retinoscopy; their purpose would have been amply served by two figures incorporated in the text. With reference to the notation of the angles at which cylinders should be set, Dr. Lendon says; "By far the best way is to have two nasal zeros, as in Fig. 13." The standard notation in which 30° indicates that the right end of the axis is raised 30° from the horizontal is far preferable, for no further specification is then required and it is in complete accordance with the notation that is universally accepted in mathematics. We have nothing but praise to give for the printing, paper, and binding of these somewhat unnecessary volumes.

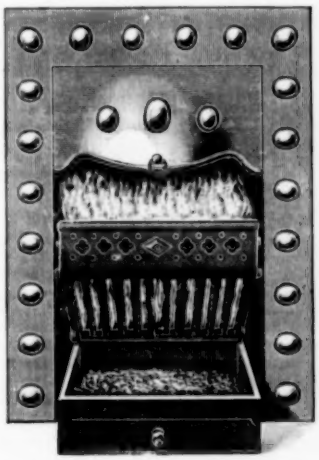
The Key to Sight-testing. By H. L. TAYLOR and W. S. BAXTER. Birmingham: J. and H. Taylor. 1902. Pp. 355. Price 6*s.*—This book is written by practical opticians for the use of opticians and not of ophthalmic surgeons. It is divided into three sections, the first dealing cursorily with the Eye as an Optical Instrument, its physiology, and even with its pathology. We fail to see what an optician has to do with ocular affections peculiar to anæmia, diabetes, gout, kidney, and brain disease. These few affections are taken at random from the 20 diseases dismissed in as many paragraphs. We note, however, that syphilis is not mentioned. The book would be more useful to the optician if more information were given about the optics that are daily required by the working spectaclemaker, instead of confusing him with using the same symbol (D.) to denote the curvature of a lens and its refractive power in dioptres. The second section is on the Testing-room and on the recognition of ametropia, heterophoria, and other points which are the special subjects of the ophthalmic surgeon. This section describes well the use of the pinhole diaphragm, the stenopaic slit, the ophthalmometer, and the case of trial lenses. The method of retinoscopy is shortly but fairly well described, but we must protest against opticians using the ophthalmoscope to recognise optic neuritis, optic atrophy, choroiditis, and hæmorrhages, even if such observations are "mentioned to the oculist taking the case over." Five pages are devoted to the use of the perimeter and four and a half to ophthalmoscopy, the reader being referred to Haab's Atlas of Ophthalmoscopy for further information. The third section is on the Workshop and deals with spectacle-frames and the tools and appliances required for fitting them. This section appears to be good and we note with pleasure the strong recommendation of the standard notation for the determination of the angle at which the axis of a cylinder should be set. This is one in which the angles are measured in both eyes in the counter clockwise or positive direction from the horizontal meridian.

New Inventions.

THE WESTMINSTER ECONOMIC STOVE.

MOST stoves intended to bring about the complete consumption of coal, that is, without the production of smoke, involve alterations in the ordinary domestic heating methods to such an extent as to put them beyond the bounds of practical application. By the arrangement suggested in the Westminster Economic Stove, however,

FIG. 1.

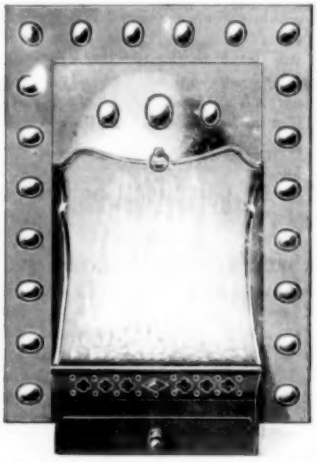


Stove with the fire grate up.

the change does not require any severe structural alteration. The efficiency of the stove is patent from the fact that by its means even refractory anthracite or coke may be lighted just as quickly as ordinary bituminous coal. In fact, the stove has been designed essentially for burning smokeless fuel, although by its construction the formation of smoke from smoky coal is decidedly minimised. A glance at Fig. 1 will explain the principle upon which the successful working of the stove depends. Instead of a fixed

grate a pivoted movable one is adopted, which may be lifted up at a little less than a right angle with the ash-pit at a point quite close to the dome at the top. In this position it is obvious that the whole of the air supply must pass through the bars and through the fuel. That is to say, at lighting there can be practically little air passing up the chimney which is not concerned in the combustion of the fuel. The result is a powerful draught which soon produces a sort of blow-pipe flame which will readily ignite anthracite or coke, while in the case of coal the air is so heated that the combustion is very effective. The lighting of the fuel occurs with great rapidity. As soon as the active combustion of the fuel is established the grating may be lowered to its ordinary position over the ash-tray. The stove works with a decided economy and with a minimum production of smoke and soot, as is easily observed from the state of the chimney after the stove has been in use for some time. The appearance of the

FIG. 2.



Stove after lighting, with the fire grate down.

stove with the fuel alight is shown in Fig. 2. Certainly the stove is very powerful in producing radiant heat—a fact which shows that the combustion is active and not sluggish, in spite of which the consumption of fuel is distinctly economical. The Westminster Economic Stove is the invention and property of Messrs. Bostel and Sons of Ebury-street, London, S.W.

ROYAL EDINBURGH HOSPITAL FOR SICK CHILDREN.—The forty-third annual report of the Royal Edinburgh Hospital for Sick Children states that during the year ending December, 1901, 1616 cases were treated in the wards and 7015 out-patients attended at the dispensary. The surgical operations numbered 1434. The financial report shows a large deficiency in the ordinary income, but notwithstanding an increase in the number of patients treated during the year the expenditure has fallen. The directors are gratified to notice that there is a growing interest taken in the hospital by Sunday scholars a sum of over £129 having been collected in Sunday schools for the charity.

DONATIONS AND BEQUESTS.—The late Mr. W. H. Loder of High Beeches, Handcross, Sussex, bequeathed £1000 to the Cheyne Hospital for Children for the endowment of a "Winifred Cot" which had been previously maintained by Mr. Loder and his wife, and £500 to the Sussex County Hospital.—Under the will of the late Mr. H. K. Hebb of Lincoln £500 are bequeathed to Lincoln Hospital and £50 each to the Lincoln General Dispensary, the Mabelthorpe Convalescent Home, and the Royal Bath Hospital at Harrogate. The Hertford Infirmary benefits by a sum of £200 under the will of Mr. A. P. MacMullen of Hertford.

THE THAMES CONSERVANCY.

THE general report of the proceedings of the Conservators of the River Thames for the year 1901 shows that they have carried out an enormous amount of useful work. The chief part of the funds at their disposal is spent on the lower river but the amount of money at their command is quite inadequate for the execution of all the work which ought to be done. During the last year some unusual expenses had to be incurred in connexion with the Royal Commission on the Port of London. It may be hoped that the recommendations given in the Commissioners' report will be so far adopted as to ensure that the Port of London shall not lose all its trade, and it is perfectly obvious that the Conservators of the Thames have never been able to carry out the work they thought necessary because they have always been hampered by want of money. Amongst the various duties of the Conservators the purification of the upper river, however, is the only question with which it is incumbent upon us to deal from a sanitary point of view. Under the Thames Act of 1894 the powers of the Conservators in regard to river pollution were extended to embrace the whole of the Thames watershed above the western limits of the metropolis. In carrying out their duties, as most riparian owners and as all the local sanitary authorities know, the Conservators have been most persistent, but they have never taken legal action unless and until it was quite evident that no attempt was, or was likely to be, made to remove an existing cause of pollution. The inspecting staff of the board constantly visit all the centres of population within the area which is under their supervision and the sewage effluents which discharge into the river are frequently analysed. During the year 1901 26 towns and villages diverted the pollutions with which they had previously defiled the water, and amongst these places were Cranleigh and Woking, Wendover and Thame, Newbury and Hemel Hempstead. At some other towns the requirements of the Conservators have not yet been complied with, and amongst these are Witney, Chipping Norton, Marlborough, Kingsclere, Rickmansworth, West Drayton, and Leatherhead; but in most cases steps are being taken to effect improvements. In some places nothing was done because difficulties supervened in regard to the acquisition of land for the purpose of sewage disposal. At Amersham, Watlington, and Hungerford the local authorities have at length reached the stage at which "schemes" are proposed. The Aylesbury sewage effluent has been improved. During the year legal proceedings against peccant local authorities and individuals have been taken in only 11 cases. In two instances the persons summoned thought it wise at once to comply with the Act and in six other cases they promised to do so. In a large number of instances (263 in all) pollution has been diverted from factories, farms, and private houses. The inspection of house-boats and launches on the Thames has been regularly carried out with a view to ensure that the sanitary arrangements on board are in a satisfactory condition. Considerable improvement has been effected in this respect since attention was first prominently called to the matter in the columns of THE LANCET some years ago.

There is still an important matter over which the Conservators at present have no control, the absence of which is a distinct flaw in the Conservancy Act of 1894. At any distance greater than three miles from the Thames they have no authority to enable them to prevent the passage of trade refuse into the streams. The Conservators suggest in their report that their general powers for preventing these pollutions above the metropolis should extend over the whole of the watershed without limitation. We entirely agree with this recommendation.

The Thames Conservators have constantly carried out their duties with efficiency, with tact, and with economy. They have never wasted the money entrusted to them in vexatious litigation. No public body possessing sanitary control in this country has ever done anything like so great a work with so little fuss and with such constant care. They may safely be entrusted with the increase of power for which they ask; it is indeed evident that the purity of the Thames cannot be effected whilst trade pollutions are permitted to defile the waters of its tributaries.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 20, 1902

Virchow as Pathologist.

IN estimating the influence of VIRCHOW'S work on the evolution of contemporary pathology and in appraising the practical value of his labours in the interpretation of disease it would be unjust to his genius to enumerate merely the roll of his positive achievements. His victories lay rather in his fearless exposure of the many false premisses and conceptions which obscured and paralysed the progress of medical knowledge, in redeeming from all suggestion of mysticism our understanding of the essential processes of disease, and in establishing for all time on the firm basis of truth the principles which should guide us in every biological inquiry. In organic evolution it is ever interesting to hazard a speculation as to what might have been the ultimate term of any particular series had any one of the factors in the chain of events which produced such a series been different in kind or in degree. What, for instance, would have eventuated in the evolution of the animal series had there been no glacial period? or what would have been the ultimate effect on the development of man had some great upheaval of nature destroyed our first vertebrate ancestor without giving him an opportunity of stamping his individuality upon succeeding generations? And in like manner the speculation is not without interest to consider what would have been the trend of evolution in pathology had not VIRCHOW arisen with almost superhuman omniscience to knit together the tangled threads of divergent opinion into a homogeneous fabric of rational medicine? Would progress have advanced along the discordant lines of humoral pathology? would the embittered strife of opposing schools still sap the energy of giants and direct the stream of genius into profitless and barren channels? should we still be seeking for the essence of disease in the Archæus of PARACELSUS? and would the grosser problems of pathology still remain unsolved, tarrying for the unfolding of the secrets of life? However, without indulging further in vain speculations as to the possible fate of present-day pathology had not the genius of VIRCHOW indicated the path which leads to the haven of truth, we will proceed at once to a consideration of the positive results of his investigations and arguments and of his influence in the determination of the universal theory of disease which to-day is accepted in every quarter of the civilised world.

Concisely stated, this theory is that all disease presupposes life and that life is the property of the cell. The activities of the cell are the expression of this life, and they are evoked by stimuli of various kinds which reach the cell from without. The activities of cells individually or collectively are called physiological or normal as long as the general equilibrium of the organism is not disturbed. They become pathological when they overstep this limit. The conception of the identity in kind of these two vital processes—physiology and pathology—we owe largely to VIRCHOW. His discovery that all animal tissues which gave physiological or pathological evidences of life were composed of individual cells which responded to stimulation made it possible to apply this universal law of disease to every organ or structure in the body. He proved with the inadequate means at his disposal that bones and cartilage and connective tissue were anatomically constructed on the same cellular plan which applied in the case of muscles or secretory glands. He further showed that under the influence of appropriate stimuli each individual cell was capable of dividing and becoming two, and thus he not only explained growth, regeneration of tissue, and tumour formation, but, to use his own words, he was in a position to give utterance to the dictum, *Omnis cellula e cellulâ*, and to close the great gap which HARVEY'S Ovistic theory had left in the history of animal organisation. The far-reaching applications of this great truth were probably hardly realised by VIRCHOW at the time when he formulated his immortal aphorism, and it is possibly no hyperbole of speech to say that even to-day its significance to a considerable number of minds is little more than a denial of the possibility of spontaneous generation. The conception of disease as a process and not as an entity is founded on a recognition of the law that cells respond to stimuli by the manifestation and transformation of energy, and there is no branch of medicine or pathology which has not been profoundly affected by the application of this general principle. We can recognise in the protean symptoms of syphilis the consequences of cell excitation due to the circulation of some intangible poison which we cannot isolate and which we have never seen, but which by the particular application of VIRCHOW'S teaching we know must exist. We can recognise in tuberculosis the effects of constitutional poisoning and the formation of granulations and cells of distinct morphological structure due to the presence of living and organised stimuli which indirectly he has enabled us to isolate, recognise, and define. The insistence on the part of VIRCHOW that specific stimuli produced specific results, that the character of the pathological lesions are dependent on the specificity of the stimuli—that is to say, on the qualitative rather than on the quantitative properties of the irritant—brought him into direct antagonism with HUEPPE and his school and exposed him to the satirical eloquence of that philosopher and bacteriologist. The study of the life-history of bacteria as occasional causative agents in the production of disease is a comparatively new, albeit a highly fruitful, line of research which in the light of VIRCHOW'S cellular pathology has been opened up and placed upon a rational basis. It is perhaps not too much to say that the development of our knowledge with regard to immunity to the formation of toxins and antitoxins is founded on principles which have been directly evolved from the fundamental conception that the cells in the animal body react mechanically and chemically to foreign stimuli. On no other physiological basis could their

significance be intelligible or the part which they play in the determination of disease be logically explained.

In 1858, when VIRCHOW published his "Cellular Pathology," the work, for which his memory will be for ever immortal, was in a sense complete, and it is a curious coincidence that another work, which won its author everlasting fame and was also in itself almost a complete system of biology—namely, DARWIN'S "Origin of Species"—was likewise published about the same time. VIRCHOW, like DARWIN, sprang into fame with startling suddenness; both of them commenced their illustrious careers by propounding a unitary theory of life which revolutionised their respective departments of biology, and both of them spent the rest of their lives in substantiating details which, though of individual value and interest, were almost entirely of secondary and subsidiary importance in comparison to the limitless possibilities of the great arguments which were outlined and unfolded in these monumental volumes. The record of VIRCHOW'S published writings has probably never been equalled by any other scientific investigator. The mere titles of his contributions to pathology, quite apart from other subjects, fill more than 20 pages of SCHWALBE'S closely written bibliography, a volume which was published to commemorate the veteran pathologist's eightieth birthday and which was a complete record of all his published works. Among the more important results of these prolific labours must be included his early investigations into the conditions of vascular inflammation and the refutation of the then accepted theory of phlebitis, while our knowledge of embolism owes its origin and a large measure of its further development to his histological and experimental researches. In this connexion it is interesting to note that PAGET, to whom VIRCHOW undoubtedly owed certain inspirations for his "Cellular Pathology," should have noticed the same morbid changes in various forms of embolism which VIRCHOW subsequently described and to which he attached a true pathological significance. He further indicated the difference between leukæmia and pyæmia and paved the way for the brilliant results which have more recently been achieved in the differential diagnosis of kindred conditions by the finer methods of hæmatology. We further enjoy the fruits of his labours in a better understanding of the puerperal condition, of animal pigments, of lardaceous disease, of trichiniasis, of syphilis, of leprosy, of cholera, of diphtheria, and of tuberculosis; in fact, there is no branch of pathology which has not benefited by his labours and by his research, and for the most part that famous series of volumes, VIRCHOW'S "Archives," keeps the record. Like other great men, VIRCHOW made his mistakes, but as often as not it was his own hand that led to his own undoing. His view that the cells of connective tissue were able to take part in the pathological new growth of epithelial cells was based on erroneous observations and his explanation of the deformities and symptoms in cases of cretinism is founded on a pathology which is peculiarly narrow, while his opinion that the pathology of chlorosis could be explained on anatomical defects in the circulatory system and blood-forming organs is clearly at variance with ascertained facts.

RUDOLPH VIRCHOW is destined for ever to be remembered as the father of rational pathology and the first initiator of a philosophic system of medicine. Although his conception of disease has in no way elucidated the secrets of life or of protoplastic activities it has nailed the interpretation of the grosser phenomena of disease to the mast of cellular physiology.

The Present Position of Chemical Physiology.

IN the lucid and suggestive Presidential Address delivered by Professor W. D. HALLIBURTON, F.R.S., before the Physiological Section of the British Association at Belfast, and published on p. 787 of this issue of THE LANCET, he points out the important part which chemical and physico-chemical investigation has played in physiological and pathological research within recent years and the increasing practical application of the results obtained. He deprecates the tendency of some observers to revive the vitalistic explanation (or so-called explanation) of imperfectly understood physiological phenomena and suggests that our knowledge of physical laws cannot be regarded as final and complete—that the apparent failure of these laws to explain some phenomena in living tissues may be due to imperfect knowledge of those laws rather than to the operation of some "vital" force.

Professor HALLIBURTON pleads for bold experiment and "bold theorising from experimental data" to stimulate and to suggest further ideas for investigation and further generalisations of scientific and practical interest, and herein lie a danger and a difficulty. The danger is in the tendency, unconscious, no doubt, of some theorists to invest the theory with the importance of the experimental facts; the difficulty lies in the peculiar relation of the subject of chemical physiology (or rather of bio-chemistry, to adopt the more comprehensive term recently introduced) to the medical practitioner's curriculum; for while a knowledge of certain elementary properties and reactions of the more important substances occurring normally or abnormally in the body or in its excreta is absolutely essential for the rational diagnosis and treatment of disease, and a practical study of such now finds a place in the course of work of every medical student, the majority of the substances are of such complexity, and the problems involved so abstruse, that the knowledge of chemistry and physics necessary for their comprehension is likely to be almost limited to the expert—chemist or physiologist. At the same time, the results obtained are of such fundamental importance and the generalisations deduced of such practical value that while theoretical considerations and the technical details involved in the investigations may well be left to the expert, a knowledge of the generalisations and applications is necessary to the practitioner. This practical aspect of the subject is well brought out in Professor HALLIBURTON'S address; for example, he gives a brief review of the work of PAWLOW and the St. Petersburg school on the chemical processes of digestion and a very interesting summary of recent work on certain reactions of the blood—namely, its bactericidal, globulicidal, antitoxic, agglutinating, and precipitating properties. PAWLOW has demonstrated that the

process of digestion is a continuous one in which the various actions are adjusted to the needs of the organism—e.g., the acid gastric juice stimulates the proper discharge of pancreatic juice and the chemical constitution of the juices may vary with the composition of the food to be digested; this in addition, or as a corollary, to his well-known work on the composition and secretory mechanism of the digestive juices.

Another result of recent chemical research has been to bring into harmony various conflicting observations and, as in the notable instance of internal secretions, to demonstrate the inter-dependence of the various organs of the body in respect of their functional activities and, further, to add to medicine some exceedingly valuable therapeutic compounds. To return to the blood reactions dealt with in the address, they are largely the result of a combination of chemical and microscopical methods in research, a branch of the science of comparatively recent development but of widespread utility, and the well-known staining reactions of the blood corpuscles and other cellular elements of the body afford another example of this, depending as they do upon differences in chemical composition brought out by microchemical methods. The five reactions obtained with the blood referred to by Professor HALLIBURTON in his address are all of practical importance; that of the bactericidal and antitoxic properties in their relation to immunity, active or passive, is well known and the existence of alexines or *bacteriolysins* and *antitoxins* respectively has been demonstrated and their mode of action to some extent elucidated, since each seems to consist of two substances—an "immune body" and a "complement." The agglutinative reactions of the blood with various bacteria are now matters of every-day routine in the diagnosis of certain bacterial infections, notably typhoid fever. The more recently discovered precipitation reaction in blood, in which for the first time we have a delicate test for distinguishing between human blood and that of other mammals, is probably destined to be of great medico-legal importance, since it is extremely sensitive and is obtained with dried blood, or even with human blood mixed with that of other animals. This precipitating substance or *precipitin* is produced in the plasma of any animal by repeated injections of human blood, and is specific for human blood, though a slight reaction is obtained with that of monkeys. Similar *precipitins* can be prepared for the blood of other animals. The globulicidal property of the blood or its power of destroying red corpuscles injected from another animal, though of less direct practical value, has its importance in relation to transfusion of blood. The facts that none of these substances has yet been prepared in a pure state, that their known chemical properties are few, and that their mutual relations are practically unknown, do not constitute a bar to the practical utilisation of the reactions which they produce, but only afford an indication of the necessity for further research.

The present position of chemical physiology is, in short, in the front rank of the collateral medical sciences and it is not too much to hope, in the words of Professor HALLIBURTON, that in the future "not only physiology, but also pathology, pharmacology, and even therapeutics, will receive new accessions to knowledge the importance of which will be enormous."

Low Temperature Studies.

THOSE who have carefully read Professor DEWAR'S Presidential Address to the British Association for the Advancement of Science, the substance of which we published last week, must acknowledge that he has been engaged in a fascinating, though very difficult, field of research. The results so far gained, however, show that after all, even when pursued with the utmost patience and skill, the ultimate aim is probably beyond human realisation. Again we have to recognise that finality is beyond our grasp. All along the lines of scientific research there seems to be clearly indicated a limitation of human attainment, all that has been unfolded coming in the middle of a quite short scale, so to speak. We are able to discover and to discern only that which lies between narrow limits, all beyond being merely indications, mere shadows of a something which does exist. In regard to extremely low temperatures we are bound to acknowledge, at any rate, in accordance with Lord KELVIN'S clever deductions and experiments, the existence of a definite zero of temperature as a fundamental scientific fact. And yet, with all the wonderful perseverance and skill with which, as is well known, Professor DEWAR has attacked the problem, he admits that all efforts to attain a temperature lower than 13° absolute have met with failure; and he goes even further, and expresses the opinion that it is extremely improbable that the absolute zero will ever be reached by man. This is a somewhat disappointing conclusion in view of the extraordinary number of highly interesting facts which Professor DEWAR in his admirable researches has been able to add to our knowledge of the subject.

It is not too much to say that for all practical purposes the real history of the subject commenced with Professor DEWAR'S determination to attack the problem. Speculations as to the position of the zero had been considerable, as he shows, from the time of BACON to the present, but definite experimental work beyond the use of salt and snow, the agents employed by BOYLE and others, had not been made until, in 1759, Professor BRAUN of Moscow succeeded in solidifying mercury by the use of a mixture of snow and nitric acid. The result was of course looked upon as a wonderful achievement, seeing how strongly rooted was the idea that fluidity was the essential quality of mercury. Gradually the conclusion gained ground that whether a given substance was gas, liquid, or solid was a matter of temperature. The so-called permanent gases had, however, so far not been made to resign their normal physical state, and BOYLE in studying the action of cold upon air made the quaint and remarkable observation that cold does not "weaken the spring by anything near so considerable as one would expect." AMONTON in 1702 and LAMBERT in 1779, by ingenious arguments based on the contraction of air under the withdrawal of heat, concluded that it may be inferred that the gaseous condition is caused by heat. What was the limit, then, under which gases would fail to be, or, in

other words, what was the zero of temperature? Theory has given the answer, but practice has not yet enabled us to realise it because of the enormous difficulty—nay, impossibility, according to Professor DEWAR'S dictum—of preparing and preserving frigorific agents. The problem, however, is not so much how to produce intensity of cold as how (to use Professor DEWAR'S words) to save it when produced from being immediately levelled up by the relatively heated surroundings. By adopting vessels having a double wall, the annular space between being very highly exhausted, Professor DEWAR has been able to keep liquefied gases under much greater control. Further, the high degree of vacuum necessary for the purpose may be obtained by filling this space with an easily condensable vapour and freezing it out. Thus liquid hydrogen collected in such vessels with the annular space full of air immediately solidifies the air and thereby provides itself with a high vacuum. Machines are now made capable of producing liquid air for industrial purposes and liquid air has thus become a cheap commercial commodity. Its use has already been advocated in our columns to supersede ether or other volatile liquids as a frigorific agent in surgery. According to recent announcements, it is highly probable that the production of liquid air and hydrogen will be effected most economically by the use of machines producing cold by the expenditure of mechanical work.

Though absolute zero never has been reached and, as Professor DEWAR says, probably never will be reached, yet the successful production of excessively low temperatures has yielded results which are of the greatest importance. The cold so far produced has been sufficiently intense to involve the solidification of all known gaseous substances with the exception of helion. Low temperature research, again, has deduced that under the influence of intense cold the great majority of, and probably all (if the temperature be sufficiently low), chemical interactions are entirely suspended. And yet, paradoxical as it undoubtedly is, many varieties of micro-organisms can be exposed to the temperature of liquid air for a period of six months without any appreciable loss of vitality. Seeds, also, steeped for hours in liquid hydrogen—that is, at a temperature within 20° of absolute zero, show a similar persistence of life—their vitality is unaffected, as is shown by the fact that after their immersion in this intensely cold fluid they germinate when sown as actively as seeds that have not undergone such treatment. It is clear that the conception of vitality based upon the maintenance of chemical activity must give way. In such a case we appear to be face to face with a third state, as Professor DEWAR says, a new and hitherto unobtained condition of living matter, for at such a low temperature the ordinary chemical processes must cease. Another remarkable biological application of the results of low temperature research has been the freezing of bacteria cells into hard breakable masses from which it has been possible to express the cell plasma. Thus the typhoid organism has been submitted to the process with the result that the cell plasma has been obtained for the purpose of determining its toxic or antitoxic properties. This line of research is calculated to throw fresh light on the nature and treatment of disease. Though, therefore, the absolute zero may never be attained, yet the exploration having that object primarily in view has yielded results of the highest value, inasmuch as, amongst other things, it has given us further insight into the nature of vitality and possibly a fresh means of determining the physiology of the specific disease-producing organisms.

The broad physical question, however,—What is the chemistry of extreme heat and extreme cold?—remains unanswered. It is but another example of our range of observation being limited to within the appreciable; the "ultra" is still beyond and probably will for ever, humanly speaking, remain beyond. And it is so with the whole cosmos. What is the range of space? What is matter? What are the number and kind of vibrations which set the waves of ether in motion? The human view of these things must necessarily be very narrow. But this fact should not deter the work of unravelling some, at any rate, of nature's secrets so far as it is humanly possible to do so. Even within these narrow limits there is an infinity of truths to bring to light. If the goal is not reached the reward is great, as Professor DEWAR'S researches on the attainment of low temperature abundantly show, and we may surely take heart that thus far we may (and should) go albeit no further. The pendulum inevitably swings back.

Annotations.

"Ne quid nimis."

FUNERAL OF PROFESSOR VIRCHOW.

IN our issue of Sept. 13th we briefly alluded to the funeral of Professor Virchow, which took place on Sept. 9th, and we now supply some additional details. On Sept. 8th the body lay in state in the great hall of the Rathhaus, which had been draped in black for the occasion and everywhere displayed mourning emblems, the banners of the city and of the university being placed on either side of the catafalque and students with drawn rapiers forming a guard. At the funeral the Government was represented by the Minister of Education accompanied by the entire staff of his department, the Minister of Finance, the Minister of the Interior, and the Imperial Secretary of State for Foreign Affairs. The Imperial Chancellor also sent a representative. The members of the Royal Academy of Science and of the university were present "*in corpore*" and delegates from the great majority of the German universities were among the company, together with many officers of the Army Medical Corps, in which Professor Virchow had served at the outset of his medical career. The municipal council attended on behalf of the city and the presence of deputations from political and other societies testified to the active part which the deceased had taken in the public life of his country and to the reality of his political influence. Large as the assemblage was, the number fell short of what it would have been but for the circumstances that the university vacations had already commenced, that Parliament was not in session, and that many public bodies were having their annual adjournment; moreover, the shortness of the interval between Professor Virchow's death and his funeral prevented not a few of his friends from paying him the last tribute of respect. The spacious town-hall was, however, overcrowded, so that many

of those who were invited had to remain outside, being unable to gain admission. The ceremony commenced with singing by the cathedral choir, after which the Rev. Mr. Kirms preached a sermon. Professor Waldeyer then delivered an address in the name of the university, the Academy of Science, and other scientific institutions. Addresses were also delivered by Herr Träger on behalf of the political party with which the deceased had been connected and by the chief burgomaster on behalf of the city. The funeral procession then started on its way, headed by numerous associations, political and other, with their banners, while the representatives of the Government and of the learned societies and corporations walked behind the coffin, together with the members of the municipality. The procession, which was over a mile in length, in its progress through the streets on the way to the cemetery of St. Matthew was everywhere received with signs of public sympathy and tokens of the esteem in which the deceased was held by his fellow-citizens.

FISH AS FOOD.

THE fact that fish is an important article of diet is one which will be universally admitted, but it is not generally realised that the British people make so little use of the opportunities which nature has provided for them in the rich supplies which are to be found off the coast. Some statistical tables[1] which are published by the Board of Trade give a good deal of information, and although in their present form they are of little interest to those who have not a general idea of the way in which the fishing industry is carried on, they very clearly show that a large quantity of the fish caught is sent abroad, instead of being used in this country, and those who buy fish will be struck at the great difference in the price which is paid to those who catch it and the price which has to be paid to the fishmonger. The total value of the fish caught and landed in the United Kingdom during the year 1901 was over £9,000,000 Haddock and herrings produced £2,237,196 and £2,028,781 respectively. A little over a halfpenny a pound only was received for herrings (0·62*d.*) and three halfpence a pound was received for haddocks. Whether considered from the point of view of quantity or of money value these two fishes are the most important of those caught off our coasts. It is to be feared nevertheless that a small proportion only of the poor of the country have been able to obtain either of these in an appetising form at a low price. It is usually said that the poor are not fond of, and will not eat, fish. This is a very old idea. It was stated in a series of articles written on the fishing industry more than 50 years ago. It is said to-day. It is perfectly true that the poor of London are not partial to fish which they have to cook for themselves. If any unprejudiced observer possessing a keen sense of smell will walk down the streets in which fish is exposed for sale on barrows he will not be surprised that this is the case. It is by no means true that the poor who live in fishing towns and villages object to fish. It forms the most important part of the nitrogenous food which they take. The partiality for fish extends also amongst the people as far inland as the supply of fresh caught fish is obtainable at a moderate price. There are, of course, many parts of the country which by the nature of things cannot be so cheaply or so well supplied as the places near to the sea. For this reason it is a matter of national importance that the curing and preserving of fish should be well carried out. In this matter there is room for much improvement. To those acquainted with the common haddock of London it is only necessary to recall its iridescent appearance and ammoniacal odour. Many of these fishes are in a state of partial decomposition when they are cured and the methods adopted are neither wholesome nor cleanly. The local sanitary authorities are often disinclined to interfere with the arrangements of fish-curers, sometimes, perhaps, because they look upon their industry as the mainstay of the place, sometimes, doubtless, because things have been so carried on time out of mind, and what was good enough for their fathers ought, as they say, to be good enough for them, for they are a conservative people. THE LANCET has had occasion to call attention to cases in which obvious sanitary rules were disregarded in the process of curing. We wish that the authorities in fishing centres would realise that it is to their true interest, as well as their duty, to carry out the law in regard to nuisances. If the fish-curers were more careful to ensure a good and uniform quality in their output they would enormously increase their trade and their profit. It is because fish preserved in this country is of such uncertain quality that the fashion of relying so much on foreign produce has become so very general and that sardines are so highly esteemed. It is said that the English sprat tinned in this country is now transported to France that it may be duly labeled and consigned to England for the benefit of those who eat "sardines" and practise "economy" at the same time. Good bloaters and kippers are superior in all respects to the cheaper sorts of "sardines," but at the present time they are not readily obtainable, although nearly 2,000,000 barrels of herrings were exported last year, chiefly to Germany.

[1] Statistical Tables and Memorandum relating to the Sea Fisheries of the United Kingdom in the year 1901, including also a Return showing the Quantity of Fish carried by Railway from each of the Principal Ports of England and Wales, Scotland, and Ireland in each year from 1896 to 1901 inclusive.

THE USE OF CHLOROFORM IN PARTURITION.

WE publish in our correspondence columns a thoughtful letter from Dr. T. W. Parkinson dealing with the use of chloroform in labour. It is probable that Dr. Parkinson has exaggerated somewhat in saying that the use of chloroform is at the present time much restricted in obstetric practice, but none the less we commend his judicious remarks to the notice of junior practitioners. All medical students, in London at all events, now have to receive instruction in the use of anæsthetics, including chloroform, and we doubt not that among the cases which they have to conduct there would be no difficulty in including those attended in the maternity departments of the hospitals. The objections to the use of chloroform have been of two kinds: (1) the sentimental, now happily set to rest by the more healthy tone of religious feeling, and (2) the practical. Dr. Parkinson discusses these and we are in harmony with his contentions. It cannot be too strongly insisted upon that the administration of chloroform in labour differs in many particulars from that required for surgical operations, hence the importance which Dr. Parkinson rightly attaches to the need of giving students an opportunity of learning the special requirements of a woman in normal labour. The gravamen against chloroform is, we are sure, not its use but its injudicious and ignorant employment. In most stages of labour chloroform should be given as an analgesic, not as a means of inducing full narcosis, and the degree of narcosis required is the lesson to be learnt by the practitioner before he can obtain satisfactory results. The commission appointed by the Royal Medical and Chirurgical Society, which presented its report in 1864, dealt with the assumed increased danger of post-partum hæmorrhage and of peril to the child and its finding was that no such danger arose. This, we believe, is also the experience of all who have used chloroform largely in maternity hospitals. With regard to the supposed failure of tonus of the uterus and abdominal muscles in cases in which chloroform is employed the following points are worthy of notice. The

influence of chloroform upon muscular tissue is not, according to most experimental results, very marked and is certainly far more delayed in the case of the musculature of viscera and the internal organs than in that of the skeletal muscles. Further, it is a well-known fact among surgeons that the abdominal muscles are among the last "to give" under chloroform. In abdominal sections a most profound narcosis is required before complete relaxation of these muscles can be obtained—a far more profound narcosis than is ever needed for women in childbirth. When these facts are borne in mind it is hard to understand why any experienced accoucheur should hesitate to spare the patient the pangs of labour. It is quite probable that the casual way in which chloroform is given in many cases of parturition by nurses or persons quite uninstructed, or even by the patient herself, has caused the dread of ill consequences. Chloroform so given may cause ill-effects, and fatalities even have arisen, but it is quite unfair to attach the blame of such accidents to the use of chloroform.

ECTROMELUS.

THE interesting case of ectromelus reported by Dr. John McGibbon, which appears on page 811 of this issue, is not so very uncommon. Dr. Gould and Dr. Pyle in their "Anomalies and Curiosities of Medicine" give a number of instances, together with some curious illustrations. A celebrated case of ectromelus, and one not mentioned by Dr Gould and Dr. Pyle, was that of Matthew Buchinger. He was a native of Nürnberg in Germany and was born on June 2nd, 1674. His upper extremities, to judge by his portrait, were somewhat longer than those of the child whose portrait we reproduce. He is said to have been very accomplished, being able to play various musical instruments, including the flute. He could also write and draw coats-of-arms which were executed in Indian ink with a pen. He could moreover juggle and shave himself. He was married four times and had 11 children and his total height was 29 inches. He died in 1722. Possibly, however, the most remarkable example of this condition was the late Arthur Kavanagh, M.P., a review of whose biography appeared in THE LANCET of March 14th, 1891, p. 608. He suffered an intra-uterine amputation of both legs and arms just below their upper third, and when little more than a boy he could write, draw, ride and drive, shoot, and fish. He became a very fair amateur draughtsman and wrote legibly. As to the use of this condition in fiction, it will be sufficient to remind our readers of the recently published novel, "Sir Richard Calmady."

THE PROSTITUTION OF THE POST-OFFICE.

WE received this week from a correspondent to whom it was sent a pamphlet describing and illustrating the use of a certain remedy prepared by a chemical manufacturing company in the United States of America. It has coloured illustrations of a young woman, more or less dressed in a frilled nightdress, with the remedy being applied to various portions of her body. Our correspondent wants to know if it is decent that such illustrations should be dropped into the waste-paper basket of an ordinary household. He considers that some steps should be taken to lessen the burden of actual work entailed upon medical men in England by having to tear up the various advertising pamphlets which they get from St. Louis and elsewhere in the United States before casting them into a waste-paper basket. We have upon many previous occasions referred to abominable advertisements issued on a post-card which can be read by anybody and everybody and containing flaming details about disorders of menstruation and other sexual complaints, and we cordially sympathise with our correspondent. It is perfectly disgraceful that the post-office should make itself the medium for the dissemination of abominations such as we have referred to and for the still more disgusting effusions sent out by the *soi-disant* Dr. Bell, the Reverend David Jones, the Reverend John Wilson, and other swindlers and quacks. A new Postmaster-General has recently been appointed and we earnestly beg of him to introduce some method of stopping the dissemination of filth. It is useless to say that the post-office officials have not time. They have plenty of time to inspect envelopes containing invitation cards and to surcharge them as being in the nature of a letter, and if they can do this they can certainly stop "Dr." Bell and the other blackguards whom we have mentioned. We are glad to see that our contemporary *Truth* refers to the matter in the current issue, but both *Truth* and ourselves have been trying for so long to get either the police or the post-office to interfere in the matter that we begin to despair of any remedy.

THE DISTRIBUTION OF PLAGUE.

A TELEGRAM from the Governor of Mauritius received at the Colonial Office on Sept. 12th states that for the week ending Sept. 11th there were 3 cases of plague with one death. As regards Egypt the weekly return issued by the Director-General of the Sanitary Department states that from August 25th to the 31st there was but 1 new case which occurred at Alexandria. The number of deaths was 3 and 3 cases remained under treatment. With regard to sanitary measures there were 10,474 rooms disinfected and 398 limewashed. 247 sacks of effects were disinfected and 2137 sacks of rubbish were burned. The number of rats killed and burned was 242. As regards Hong-Kong, a telegram from the Governor, received at the Colonial Office on Sept. 16th, states that for the week ending Sept. 13th there was 1 case of bubonic plague.

THE AGAPEMONITES.

THE recent occurrences at the headquarters of the almost forgotten sect of the Agapemonites lead us to remark that in nothing is the definition of insanity—viz., that it is a condition out of harmony with the environment—more justified than in the victims of religious enthusiasm and fanaticism. On the face of it Mr. Pigott, who claims to be the Messiah, is either fraudulently deceiving his followers or else he is suffering from a delusion or from that form of religious exaltation which cannot be distinguished from it. Now it is a peculiar fact that all historical accounts are clear about the admixture of the sexual element with ecstatic religious exaggerations, and the very name and the past revelations concerning the "Agapemonites" harmonise with the perverted cant, the spurious religious demonstration, and the sexuality which are so familiar to those conversant with the epileptic wards of asylums. In the desire for publicity, in their personal disregard of criticism and even of injury or violence at the hands of those who dissent from them, these fanatical upholders of morbid Christianity carry on their incoherent ravings with the same fervour as the Anabaptist dupes of John of Leyden and the befooled believers of Joanna Southcote. It is very probably true that the action of some of the newspapers and of a section of the public in making these persons notorious is just what they desire and that the best way of treating them is to ignore them severely, but there is still a danger to society in the toleration of these enthusiasts, for of all people they are just those who recruit their ranks from the large number of hysterical and neurotic folk who are only too ready to fasten on to any cult of the moment which excites their impulsive

organisations. In Germany such a pretender would share the fate of the "Faith Healers" and be promptly suppressed, but the forcible extinction of any sect, however absurd, would in this country lead to indignant protest and to a rapid increase in the number of adherents to the "persecuted cause," so easily is the insanity of sanity brought into evidence. In the present instance, as in the past, we can but indicate the medical man as being the only means by which Mr. Pigott and his co-delusionists can be properly dealt with. A thorough medical examination by experts in the investigation of mental obliquity would probably result in the transference of impostors of this class to the seclusion of an asylum where their vagaries could only be carried on under restricted conditions. To deal with them as seriously deserving of logical treatment is as impossible as is the attempt to argue a general paralytic out of his fool's paradise.

MASSAGE AND "MASSAGE."

IN that much-perused romance of the last publishing season, "Kim," its author, Mr. Rudyard Kipling, gives an elaborate description of the cure of the said "Kim" when suffering from general malaise, induced, it would appear, by prolonged fatigue, mental and bodily. The Sahiba, in whose hands he was a half-comatose and wholly unresisting patient, began the treatment with what seem to have been very drastic emetics—"drenches that smelt pestilently and tasted worse. She stood over Kim till they went down and inquired exhaustively after they had come up." Then, "when the body was cleared," she called in a sister practitioner—"a cousin's widow, skilled in what Europeans, who know nothing about it, call massage." Thereupon, "the two of them, laying him east and west that the mysterious earth-currents, which thrill the clay of our bodies, might help and not hinder, took him to pieces all one long afternoon—bone by bone, muscle by muscle, ligament by ligament, nerve by nerve. Kneaded to irresponsible pulp, half hypnotised by the perpetual flick and readjustment of the uneasy *chudders* that veiled their eyes, Kim slid 10,000 miles into slumber—36 hours of it—sleep that soaked like rain after drought." On emerging from this, the Sahiba fed him on "fowls, vegetables, spices, milk, and onion, with little fish from the brook—anon, limes for sherbets, quails of the pit, then chicken livers upon a skewer, with sliced ginger between." As the result of this "massage" (which Europeans know nothing about), followed by the strangely-compounded meal (of which they are equally ignorant), "Kim," we are assured, "sat up and smiled. The terrible weakness had dropped from him like an old shoe." He had, it is right to say, "youth on his side"—such an allowance of it, in fact, as enabled him to survive first the "massage" and then the "meal." What, indeed, but "youth" and a general "resisting-power" as abnormal as the treatment can explain the fact that, already semi-comatose with histolytic waste in the system, he could yet find room in his circulation and excretive energy in his kidneys for the accumulation of still further waste contributed by a kneading process, uninterrupted for a long afternoon, and practised by two sinewy hags who did not leave off till every tissue in his body was reduced to "pulp!" Kim's services to British rule in India were, Mr. Kipling tells us, of signal value. The bequest of his body to the museum of the Calcutta Medical College, in the remote contingency of his death, would be of no less value to pathological science. But, persiflage apart, Mr. Kipling's claim for the superiority of Hindoo massage, as practised by the Sahiba, over the European massage, as performed by an expert under duly qualified medical advice, is but another instance of the loose talk in which even clever men indulge on subjects outside their competence. Massage, in fact, since its revival by Dr. Mezger of Amsterdam in 1853, has come to be employed in medicine only in a well-defined class of cases—employed, moreover, by persons specially qualified and certified and acting under the direction of the physician or surgeon in attendance. In the training of such persons the Swedish schools—notably, Stockholm and Upsala—have, greatly to their honour, taken a lead, granting a diploma to aspiring "masseurs" and "masseuses" only after thorough examination. So practised and medically controlled massage is an important adjunct to treatment, steadily, if slowly, living down professional disfavour and misgiving, due to such disastrous products as the "massage-kidney"[1] and other such lesions which we hope Hindoos as well as "Europeans" will ere long "know nothing about."

PTOMAINE POISONING.

CASES of ptomaine poisoning have occurred in several places in addition to those which were mentioned in THE LANCET of Sept. 13th, p. 756, and in each instance the source can be traced to pork pies purchased from the same pork-butcher at Derby. Six persons were seized at Sheffield, of whom one has since died. Several people were also attacked at Uttoxeter, one case proving fatal. A family of seven persons at Walthamstow were taken ill after having partaken of a pie sent from Derby, and at Cheltenham a number of persons were reported ill from a similar cause. Dr. Sheridan Delépine has presented his report to the Sanitary Committee of the Derby Corporation on the samples of pork pie entrusted to him. He had succeeded in isolating a bacillus belonging to the colon group, which he considered had produced the symptoms observed. The full report has not yet been published, but we understand that Dr. Delépine is of opinion that the meat or the jelly, or both, used in the pies became infected in the course of preparation, whilst the flour, lard, and seasoning of the pies were not contaminated. He further shows that animals inoculated with the bacillus have died and the same variety of bacillus has been isolated from the blood of those animals. If these statements have been correctly reported, the present outbreak cannot accurately be termed one of "ptomaine" poisoning. The symptoms were caused apparently by the toxins eliminated by the colon bacillus, and their pathology would materially differ from previous outbreaks which have been due to alkaloids formed by decomposition of organic substances due to putrefactive organisms.

EXTRANEOUS DEPOSITS IN URINE.

STRANGE errors occasionally are made in determining the nature and source of urinary deposits. Quite recently we received a communication from a correspondent who stated that he had been attending a patient suffering from subacu e muscular rheumatism and who had been taking a teaspoonful of sulphur in milk every night. The urine was slightly turbid, and deposited amorphous sulphur. Our correspondent had eliminated the usual sources of accidental contamination such as cleanliness of the collecting vessel and purposeful addition and asked for information as to whether sulphur could be eliminated by the kidney in a solid form. In a subsequent letter, however, he stated that he had questioned his patient more closely and he found that she had been in the habit of using a dusting powder containing sulphur for local irritation. A similar case was also brought to our notice in which a specimen of urine was sent for examination under the supposition that it contained "amyloid corpuscles," bodies which somewhat resemble starch granules in appearance owing to their concentric variations. They occur in the semen and hence the

[1] THE LANCET, Oct. 2nd, 1897, p. 862.

practitioner who sent the sample thought that they might occasionally find their way into the urine. In this case, also, questioning the patient showed that the source of the deposit was a powder containing starch. In another instance, in which a urine contained a sediment of "uncertain character," microscopic examination revealed the presence of the threads of leptothrix buccalis together with fragments of meat and vegetable fibres, thus plainly indicating that the deposit originally came from the mouth. Patients occasionally add substances to the urine for purposes of deception, but the above cases show how important it is not only to make sure that the collecting and examining vessels are perfectly clean, but that in doubtful cases the patients themselves should be carefully questioned as to possible sources of error. Other extraneous matters also lead to mistakes and we have seen a fragment of pine-wood from the floor mistaken for an epithelial cast; moreover, particles of silk, cotton, or linen fibres frequently puzzle students who are not conversant with their nature.

SNAKE-BITE AND SNAKE-LORE.

THE subject of snake-bite may occasionally engage the individual practitioner in a moorland country-side where, especially in the summer and autumn, cases are not unknown of infants dying from collapse after being bitten by vipers. We have recently been informed that the "infallible remedy" used by "Brusher" Mills, the well-known New Forest snake catcher, for the bite of the adder or viper is the fat of the creature itself melted, bottled, and applied a drop at a time to the wound. The cure, he asserts, is an affair of two minutes. Mills has, of course, had immense experience with snakes, having in his day killed or taken more than 4000 venomous and 27,000 harmless specimens. He has, in fact, practically devastated his own field of operations round Lyndhurst. His belief in his remedy is shared by Wiltshire and Hampshire rustics and is doubtless universal in the country districts of England. The question is whether this treatment is merely a survival of the old savage homœopathy which ordains a hair of the dog that bit you as a cure for the bite, or whether it is a rude form of serum-therapy. Vipers are exceedingly quarrelsome from the moment they break the egg and unless immune against venom would long ago have ceased to exist as a distinct species. Hence their fat may be a kind of antitoxin. Of course, all fatty and oily substances are useful against poisons, which they doubtless absorb and isolate. The old-fashioned "London viper catchers," mentioned by White of Selborne and others always employed hot olive oil as a cure or treatment for snake-bite, and this with ammonia continues to be recommended. We read of the oil-cure in works on natural history but find no mention of the peasants' use of fat. How came it to be used in the first instance? Probably in accordance with the savage theory that fat, blood, sputum and so forth, contain the life-principle or "soul" of men and animals and are therefore a cure for any lesion. Fat was anciently used to frighten away serpents from gardens and houses. The "suet of deer strewed up and down where they [adders] come will cause them to depart," says Agrippa of Nettesheim, whose ideas, despite his scepticism, were often those of the tribal medicine-man. Bacon fat, mixed with the brains of a weazel, is recommended by him to scare away rats and mice. Drugs and charms obtained from snakes are, of course, very ancient. The witches in *Macbeth* make a baleful viper-broth, but the same mixture was also a medicine and cure for many diseases. The sloughs of snakes had also singular uses. The sixteenth century Jérôme Cardan is quoted in an old chap-book as saying, "If any do sprinkle his head with the powder of a skin that a snake doth cast off, gotten or gathered when the moon is in the full, being also in the first part of Aries the Ram, he shall see terrible and fearful dreams. And if he shall have it under the sole of his foot he shall be acceptable before magistrates and princes."

SCOTTISH POOR-LAW MEDICAL OFFICERS.

SOME little time ago Mr. Galloway Weir, M.P., asked for a return of those Scottish Poor-law medical officers who had been dismissed by their parish councils. The report is now published and shows "the number of medical officers dismissed by parish councils in each crofting county during each of the seven years 1895–1901, name of the parish council, and the cases in which a cause of dismissal was assigned." We publish this return with pleasure. It will serve to show intending applicants for Scottish Poor-law appointments which parishes should be avoided. It will be remembered that English and Irish Poor-law medical officers have a right of appeal to their respective Local Government Boards but the Scottish Poor-law medical officer has none.

County and parish.	Number of medical officers dismissed.	Date.	Whether cause for dismissal was assigned.
Argyll—			
Kilfinichen	1	1897	No.
Caithness—			
Halkirk	1	1896	No.
Inverness—			
Ardersier	1	1902	Yes.
Barra	1	1898	No.
Croy	1	1902	Yes.
Petty	1	1902	Yes.
S. Uist	1	1898	Yes.
Orkney and Shetland—			
Eday	1	1899	Yes.
Evie	1	1898	No.
Rousay	1	1900	No.
Stromsay	1	1898	Yes.
Ross-shire—			
Kincardine	1	1896	No.
Uig	1	1899	No.
Sutherland—			
Durness	1	1898	No.
Kildonan	1	1899	No.
Loth	1	1899	No.

GENERAL PARALYSIS AND ITS TREATMENT BY THE MIXED METHOD.

M. DEVAY of Lyon published in *Le Progrès Médical* of August 23rd a communication regarding the treatment of general paralysis of the insane by the "mixed intensive" method of mercury and the iodides, a method allied to the treatment with benzoate of mercury published by Professor Lemoine and to which reference was recently made in these columns.[1] He has treated in all 90 cases and gives the results obtained in 21 cases, the latter consisting of patients the course of whose illness was watched for some length of time. The results obtained by M. Devay are summed up by him under the headings of amelioration, remission, and morbification of the symptoms of general paralysis, and on the whole the issues were favourable. Although accepting the theory of the "parasyphilitic" nature of the disease he does not regard the

[1] THE LANCET, Sept. 6th, 1902, p. 690, annotation On the "Intensive" Mercurial Treatment of General Paralysis and Tabes Dorsalis.

prognosis as altogether hopeless but thinks that patients should be submitted to treatment as early as possible. The treatment consists of injection of calomel into the muscular tissues daily for a week, the single dose being one centigramme (one sixth of a grain) per injection. Potassium iodide in doses of from 10 to 15 grammes (from 150 to 225 grains) is also given daily by the mouth. Treatment is continued until improvement begins to appear.

THE PHENOMENA ATTENDING STATES OF CEREBRAL COMPRESSION.

IN an important paper published in the September number of the *American Journal of the Medical Sciences* and dealing with the subject of cerebral compression and its attendant symptoms as observed both experimentally and clinically Dr. Harvey Cushing of the Johns Hopkins University attempts to correlate the symptoms with the nature of the lesion and to explain the mode in which death may result in severe cases. The pressure exerted by a foreign body such as a neoplasm or a blood-clot is mainly local and is partly transmitted irregularly to distant parts of the encephalon. In cases of increase of cerebro-spinal fluid, as in acute hydrocephalus, generalised meningitis, and hæmorrhage into the subdural spaces at the base of the brain, there is a general increase of intracranial pressure. By making a trephine hole in the skull and fitting it with a glass plate the condition of the cerebral convolutions as regards their blood-vessels and capillaries can be easily observed under varying degrees of induced intracranial pressure. The pressure on the brain in these experiments is exerted by a bag of indiarubber filled with mercury and inserted into the subdural space through a second trephine hole near or remote, varying conditions of pressure being obtained by connecting the bag with a tube attached to a pressure-bottle of mercury which can be elevated or lowered by a pulley. This method, first used by Francois-Frank and later by Horsley and Spencer, is one that allows of all degrees and gradations of pressure being used. On watching the convolutions through the glass "window" Dr. Cushing noticed the following results. First, when the pressure was slight a distinct dilatation was produced in the pial veins of the exposed convolutions. Secondly, as the pressure was increased, the venous dilatation increased further and at this stage ophthalmoscopic examination showed dilated veins in the optic papilla (stauungspapilla). Thirdly, when the compression was further increased so that it equalled the capillary blood-pressure or slightly surpassed it, the convolutions lost their rosy colour and became blanched, while the veins remained dilated as before and filled with dark blood. Such a condition of the cortical substance, says Dr. Cushing, may account for the apathy or stupor which is associated with marked increase of intracranial pressure such as may arise from a subdural hæmorrhage and for the associated "stauungspapilla" which von Graefe was the first to explain correctly. On producing pressure by a pressure flask charged with warm normal saline solution and connected below with the subdural space the three grades of pressure appearances produced in the convolutions as before mentioned could be reproduced. In both kinds of experiments, however, stimulation of the circulatory and vaso-motor centre followed, and, after a short interval, the carotid blood-pressure rose, the capillaries were forced open by the incoming blood, and the circulation was restored in the convolutions. Dr. Cushing points out that the reflex mechanism which thus operated *viâ* the vaso-motor centre was a compensatory one which permitted the circulation to be restored in the brain after temporary arrest had been produced by increase of intracranial pressure. It was also noticed that whereas the cardiac centre in the medulla oblongata held out longest the respiratory centre soon succumbed and grew paralysed if there was any considerable increase of pressure. Hence, in cases of death from such pressure, as produced both experimentally and clinically, arrest of respiration preceded that of the heart, a fact previously noted by Horsley and Macewen. Indeed, Dr. Cushing records a case of a man who had sustained a severe cerebral injury with hæmorrhage and great pressure upon the medulla and in whom the respiration ceased entirely. Artificial respiration was constantly maintained for 23 hours, *during the whole of which time the heart continued to beat feebly*, but the respiration was never restored. Dr. Cushing also points out from his experiments (mainly on dogs) and from clinical observations that the failure of the respiratory centre is marked by an early stage of slow and shallow breathing and by an intermediate stage of the Cheyne-Stokes type before it becomes totally arrested, these conditions being therefore valuable prognostic signs.

SKIMMED MILK AND MORTALITY AMONG CHILDREN IN FRANCE.

FOR some time it has been observed that mortality among infants and children resulting from unsuitable or insufficient nutrition is far more prevalent in the north than in the south of France. Dr. Girard and Dr. Bordas have published a map on infant mortality giving the proportion of deaths due to athrepsia and gastro-enteritis. Of every 100 deaths among children 69 are attributed to these causes at Troyes, 63 at Rennes, 49 at Boulogne-sur-Mer, 62 at Amiens, 56 at Lille, and only 36 at Paris. Then going south of the Loire the proportion falls at once to, for instance, 31 per cent. at Toulouse, 12 per cent. at Béziers, and 6 per cent. only at Clermont. What seems at first sight a strange paradox is the fact that it is precisely in those provinces where there are the richest pasture lands and the most abundant supply of excellent milk that the children die from starvation. The reason is, however, very simple. These provinces have a large home and export trade in butter and all the milk is skimmed to make butter. In the south where there is no such trade the children are able to obtain some milk that has not been skimmed; hence the startling difference in the death-rates. In the great towns also, though there are many other causes tending to produce athrepsia, still the milk-supply is more strictly controlled by the local authorities and is therefore of a better quality than that which is obtained in the butter-producing countries. In Normandy and Brittany notably the authorities seem afraid to interfere with the great local industry by insisting that skimmed milk shall not be retailed to the public as pure milk. According to the law milk should be sold in bottles with labels stating whether the milk is pure, slightly skimmed, or very much skimmed. Of course, it is impossible in practice to enforce such distinctions and, indeed, this rule has done much harm, for under the cover of a label skimmed and perhaps adulterated milk has been sold which certainly was not fit for consumption under any pretext whatsoever. The stress of poverty creates a strong temptation to buy the cheaper skimmed milk and thus the children are starved. Skimmed milk and flour or bread are boiled together and sometimes a spoonful of coffee or even of alcohol is added to it and very young children or infants are fed on this. The nutritive part of the milk is exported abroad as Normandy or Brittany butter. It is the skimmed milk that aids in "the manufacture of angels" which is the most lucrative phase of the baby-farmer's business. The peasant proprietor also is so eager to make the utmost profit possible that he cannot resist removing the cream from his milk even though he has young calves and pigs to feed. But he is careful to add to his skimmed milk some maize, potatoes, and other substitutes for the

cream before he gives this milk to his cattle. He is not always so careful in regard to the children. All these abominations cry aloud for a more strict supervision and widely read papers like the *Matin* are now taking up this grievance. Statistics abundantly prove the great excess of athrepsia in those parts of the country where it is the custom to skim all the milk. Measures must be taken so that, in spite of the butter trade, children and infants may be able to obtain milk that has not been deprived of its nutritive qualities.

THE PROGNOSIS OF PLEURISY WITH SEROUS EFFUSION.

IT is now generally admitted that most cases of pleurisy with serous effusion are of tuberculous origin. Hence the question arises, What is the ultimate prognosis of cases of serous pleurisy? In *American Medicine* of June 7th Dr. Richard C. Cabot has published an important paper on the subject. He has investigated the sequels of 152 cases of serous pleurisy in which there was no evidence of tuberculosis in the lungs or other organs. Cases of dry pleurisy and of empyema were excluded. He draws the following conclusions: 1. 80 per cent. of the patients whose history was followed for five years or more were in good health. (In more than half of these the history was followed for 10 years or more.) 2. 90 per cent. of the patients were in good health from two to five years after the attack—that is, the pleurisy was not immediately connected with any other affection. 3. 15 per cent. developed tuberculosis of lung or bone, but in only 3 per cent. did the tuberculosis manifest itself within two years of the pleurisy. 4. The type of tuberculosis which occurred was usually mild and the course was slow. In half of the 23 patients who developed obvious tuberculosis death did not occur until five years after the pleurisy. 5. In two cases a very rapid form of tuberculosis developed many years after the pleurisy (nine years and 16 years respectively). 6. Only one-fourth of those persons who remained in perfect health five years or more after the pleurisy had a family or personal history of tuberculosis, while of those who became tuberculous two-thirds had such history. Hence the importance of the history in the prognosis. 7. Recurrence of the pleurisy after recovery occurred in 3 per cent. of the cases. Re-accumulation of the fluid immediately after tapping was rare. Dr. Cabot made no attempt to ascertain in what proportion of his whole group of cases the pleurisy was tuberculous. His figures show that whether pleurisy is tuberculous or not the prognosis is good provided there is no family history of tuberculosis, that when the pleurisy is tuberculous the tuberculosis is of a mild form from which recovery usually takes place, and that even when the lungs are attacked later the type of the disease usually is mild.

THE ROYAL VICTORIA HOSPITAL, NETLEY.

ATTENTION having of late been directed to the shortcomings of the large and imposing-looking hospital at Netley we are led to offer some remarks on the subject. The present site was selected and the designs for the hospital and Army Medical School were prepared at the time of the Crimean war and there can be but little doubt that the choice of the position was influenced by the fact that it was close to, and easily accessible from, Osborne. Her late Majesty always manifested a keen interest in her soldiers, especially in those of them who happened to be sick and wounded, as Her Majesty's frequent visits to Netley showed. The hospital must therefore be regarded as an old one and it was erected at a time of transition when the present acknowledged principles of sanitary construction were not established or even generally recognised as they now are. It consists of a large undivided hospital building designed on the corridor instead of on the pavilion principle. It may suffice to state that while the glass corridors occupy the sea front the wards, which are, of course, the essential part of a hospital, are at the back and have a northern aspect and are consequently deprived of sunshine. In addition to this and to the deterioration consequent upon age and occupation the building has numerous structural defects and inconveniences in other respects so that as a hospital it is much below the standard of modern sanitary requirements. The desirability of having an army medical college in London is also no new idea, but, as may be readily understood, it was a very difficult one to get carried out. Now that this has been, or is being, done, however, it becomes a question as to how the Netley Hospital and institution as a whole can be best dealt with and utilised. Pending the settlement of this matter it may be well supposed that the Government cannot, for financial and other reasons, take any step. The projected scheme for a new military hospital about to be erected on an open and admirable site near Portsmouth was not undertaken, we believe, with any view to the relief of Netley, but in order to provide an efficient substitute for the old military hospital at Landport at present used for the accommodation of the sick of the Portsmouth garrison. As regards London, the site at Millbank is a large and open one and well suited, we should imagine, for the erection of a military hospital or medical staff college, or for any other similar purpose.

THE Senator Dr. Enrico Bottini, professor of operative surgery in the Paduan School, is making a good recovery from the paralytic seizure described in THE LANCET of last week. From Freiburg-Breisgau, whither he was removed, we learn that he is slowly but steadily regaining motor and sensory power in the affected side, while his speech has returned and his mind has lost none of its clearness. Accompanied by two of his colleagues in the University, Professor De Tora and Professor Carli, he has made the journey successfully to his villa, "Il Riposo," at San Remo, on the Ligurian Riviera.

THE winter course of post-graduate clinical demonstrations given at the Westminster Hospital will be held at the hospital on Tuesdays, commencing Oct. 7th and finishing Dec. 9th. The fee for the course is one guinea, but holders of the conjoint post-graduate ticket are admitted free. Practitioners desirous of joining the course are requested to communicate with either of the honorary secretaries, Dr. J. Purves Stewart, 7, Harley-street, W.; or Mr. William Turner, 53, Queen Anne-street, W. Particulars of the meetings week by week will be found in our Diary.

THE annual dinner of the old and present students of the Faculty of Medicine of University College, London, will be held at the Hotel Cecil, Victoria Embankment, on Wednesday, Oct. 1st, at 6.30 for 7 P.M. Mr. Rushton Parker, professor of surgery in University College, Liverpool, will occupy the chair.

CENTENARIANS.—Mrs. Betsy Moore died at Bishop's Teignton, Devonshire, on Sept. 14th, at the age of 102. She was born near Salcombe on Nov. 22nd, 1800, and had lived all her life in Devonshire. She was married 80 years ago and had had nine children, the eldest of whom is 77.—Mrs. Kirby of Preston, who is 103 years of age, went for a drive through the town in a carriage on Sept. 4th for the purpose of seeing the decorations displayed in connexion with the Guild Merchant celebrations. The greater portion of her life has been spent not in Preston but in Elswick.

IMPUDENT QUACKS AND THE NAME OF THE LANCET.

SOME time since we received a courteous letter from Dr. W. Irving, honorary secretary of the Canterbury Section of the New Zealand Branch of the British Medical Association, forwarding to us "a copy of an advertisement which is being circulated in New Zealand and which is attached to each bottle of the 'Lancet Influenza Cure.'" We append below a reproduction of a portion of the cardboard case containing the bottle (Fig. 1) and also the circular sent to us by our correspondent (Fig. 2). It will be noticed that, although figures of a lancet and of a stethoscope are printed above, the type and general appearance would lead readers to infer that the quack "remedy" in question had the sanction and recommendation of this journal, especially when taken in conjunction with the words, "introduced and prescribed by Sir William Broadbent," &c., &c., &c., who, of course, has not in any way sanctioned the use of his name. We thereupon wrote to our representative in New Zealand, requesting him to put himself in communication with the firm whose name was stamped upon the circulars. This he accordingly did and received the following replies :—

KEMPTHORNE, PROSSER AND CO.'S
N.Z. DRUG CO., LTD.,
Wellington, N.Z., July 30th, 1902.

DEAR SIR,—In further reference to your letter of the 14th inst. concerning a preparation called "Lancet" Influenza Cure, we have been informed by our Head Office in Dunedin that a preparation so called has been put up by our Christchurch House.

Our Head Office is now taking this matter up, and we hope in a few days to be able to send you advice, which we trust will be perfectly satisfactory to yourself, and also to your London friends.

In the meantime,

We beg to remain, dear Sir,
Yours truly,
Kempthorne, Prosser, and Co.'s
New Zealand Drug Company, Limited.
(Signed) ROBERT E. WOOD, Manager.

Wellington, N.Z., August 4th, 1902.

DEAR SIR,—Confirming our communication of the 30th ulto. concerning your letter respecting a preparation called the "Lancet Influenza Cure," and our intimation that the line is put up by our Christchurch House, we beg to state that we are now in receipt from our Head Office of further advice in this connection. Our Head Office desires us to point out that the term "Lancet" refers to the Instrument. The term is registered, and the registration is accompanied by a sketch of the instrument as a trade mark. We might

FIG. 1.

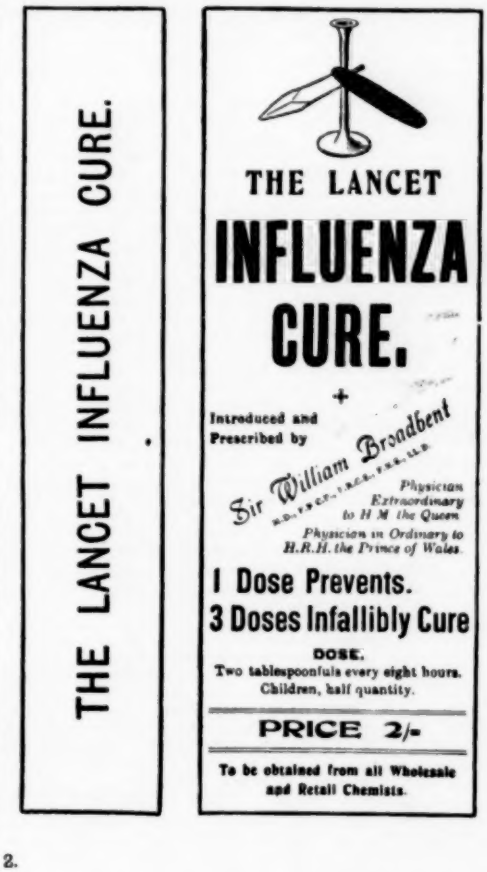


FIG. 2.

INFLUENZA
—A Contagious Catarrhal Affection of the Respiratory tract, attended with much prostration, occurring for the most part in wide-spread Epidemics.
The symptoms are too well-known to need amplification of description.
According to Drs. Squire, Bristowe, Gull, Clarke, and others, the duration of the complaint varied from three days to a fortnight.
Under the most recent and effective treatment and regime prescribed by Sir Wm. Broadbent, the disease is aborted in its initiatory stage and
Within Twenty-four hours the Patient has regained his normal condition of health.
The Lancet Influenza Cure is infallible in its action, and as stated three doses effect a complete cure.
It is, and can be, exhibited in cases of Quinsy, Diphtheria, Malarial Fevers, all Zymotic and Enteric diseases with absolute impunity, and effects a marvellous restoration to health in a comparatively short period of time.
SOLE AGENTS
The LANCET INFLUENZA CURE
NEW ZEALAND
KEMPTHORNE, PROSSER & CO'S
NEW ZEALAND DRUG Co. Ltd.
Introduced and
Prescribed by
Sir William Broadbent
Physician
Extraordinary
H.M. the Queen.
Physician in Ordinary to
H.R.H. the Prince of Wales.
1 Dose Prevents.
3 Doses Infallibly Cure.
Dose—Two tablespoonfuls every eight hours. Children, half quantity.
PRICE 2/-
INFLUENZA
That insidious disease, Influenza, with all its consequences, both immediate and remote, is
Now in our Midst.
By a feeling of lassitude, pains over the
and forehead, disinclination for
bodily or mental exertion of whatever
the loins, attended
with a cold in the head, Influenza betrays
its presence.
The Lancet
INFLUENZA CURE
by acting directly upon the bacilli inspirated into the system, and eliminating them therefrom proves a specific of immeasurable value, and effects
A Radical Cure
within twenty-four hours.
IT NEVER FAILS.

state that in the advertisement also appears a diagram of the instrument. You will understand therefore that the term "Lancet" has no connexion whatever with the London journal, of which you are the representative in the colony, and we trust that you will take the earliest opportunity of advising the proprietors to this effect.

We are, dear sir, yours truly,
Kempthorne, Prosser, and Co.'s
New Zealand Drug Company, Limited.
(Signed) ROBERT E. WOOD, Manager.

It will be noticed that Messrs. Kempthorne, Prosser, and Co. have, as we anticipated, shielded themselves under the sketch of the instrument which they have artfully inserted in the advertisement. What sort of connexion there is to be assumed between a lancet as depicted in the illustration and the treatment of influenza is difficult to imagine—the stethoscope might perhaps be of service but is not alluded to in the title of the "Influenza Cure"; indeed, its introduction would foil the real intention which we have no hesitation in saying is to pass off the quack "medicine" under a guarantee, as it were, of the title of this paper. Messrs. Kempthorne, Prosser, and Co. have made a most unwarrantable use—or rather abuse—of the name of THE LANCET. If any similar attempt were made in this country we should at once proceed to set in motion the power of the law, and we have no doubt whatever that we should promptly be enabled to stop such a scandalous use of our title, but it is obviously difficult for us to take timely and effective proceedings in the very distant colony of New Zealand. Of this, of course, the drug vendors are aware.

Sir William Broadbent has been so good as to send us a copy of his correspondence with Messrs. Kempthorne, Prosser, and Co., which is as follows:—

Dunedin, 24th July, 1902.

KEMPTHORNE, PROSSER & CO.'S
NEW ZEALAND DRUG COMPANY, LIMITED,
Dunedin, Wellington, Christchurch, Auckland.
Cable Address: Cremation.

Sir William H. Broadbent,
84, Brook-street,
Grosvenor-square, London.

SIR,—We have the honour to acknowledge your letter of 27th May last, as under:—

To Messrs. Kempthorne, Prosser & Co.

"SIRS,—I call upon you to desist at once from using an advertisement of a so-called influenza cure in which my name appears. The use of my name in connexion with this cure is a fraud upon the public and a gross insult to me.

Yours truly,
(Sgd) W. H. BROADBENT."

The same morning that we received your letter we also received another letter from Dr. W. Irving, Canterbury section of the B. M. A. (N.Z. Branch), dated July 17th, in reference to the same matter. We knew nothing whatever of the circumstance here at the head office, but at once wrote Dr. Irving, as duplicate letter herewith, and also to our branches, making inquiries in respect to this matter, and we now very much regret to find that our Christchurch Branch had been selling the article referred to, the "Lancet Influenza Cure," bearing Sir W. H. Broadbent's name.

We sincerely regret this circumstance and now fully apologise to you for having used your name without authority.

We enclose you duplicate of correspondence with Dr. W. Irving in which you will see the matter fully explained, and that we have given instructions to promptly stop the using of your name and to at once destroy any printed matter which we may have in possession bearing your name. The manager of our branch who set this thing in motion is now out of our service, and the only explanation the present manager can give is that he copied this prescription from The Lancet. However, that is a matter of no moment, whether it was copied or whether it was not, we had clearly no right in any way to use your name, and we again apologise for this unwarrantable liberty.

Sir, we are, yours truly,
Kempthorne, Prosser & Co.'s
New Zealand Drug Company, Limited,
THOMAS M. KEMPTHORNE,
Managing Director.

It will be noticed that "the manager of our branch who set this thing in motion is now out of our service, and the only explanation the present manager can give is *that he copied this prescription from The Lancet.*" Nothing more is needed to show the real intention of the quacks whose action we consider to be fraudulent as well as dishonourable.

THE NEW SANATORIUM, WEYMOUTH.—The new sanatorium at Weymouth, of which the Dowager Duchess of Beaufort laid the foundation stone in the early part of last year, is now completed. The buildings, which will form one of the finest charitable institutions in the South of England, have been erected at a cost of about £20,000.

UNIVERSITY OF LONDON: FACULTY OF MEDICINE.

INTENDING students of medicine, or their parents on their behalf, will naturally seek for information as to the extent to which the reconstitution of the University of London has modified the conditions of education and examination in the Faculty of Medicine. In the Students' Number of THE LANCET (August 30th, 1902, p. 576) there are set out extracts from the official regulations relating to the degrees in medicine which are issued by the University. The careful reader of these extracts, comparing them with those published in the Students' Number last year, will find practically no change, except as regards the matriculation examination, the revised regulations for which are fully set out below. If he has also been a careful reader of the medical press during the long period of agitation that preceded the reconstitution of the University, the fact that so little change has been made will cause him some surprise if not disappointment. Further consideration will perhaps indicate that slow progress in effecting changes was from the nature of the case to be expected and will in the end prove advantageous. In an essentially conservative country like England it is inevitable, in order that sufficient energy should be generated to effect a reform, especially a reform in connexion with education, that the evils to be removed and the benefits to be anticipated should be loudly proclaimed by those promoting legislation. It is also necessary for the promoters of legislation to take advantage of any added power that may be gained by associating in the movement reformers who do not entirely appreciate that the particular change they desire will not be directly brought about by the legislation proposed. A want of appreciation of these facts is leading to a good deal of discontent and to a certain amount of misdirected energy amongst medical teachers in the University. A careful examination of the position of affairs will enable an estimate to be made of the prospect of carrying out in due course wise reforms in medical education now that a complete teaching university is established. In the first place, it must be admitted that for all practical purposes, so far as the Faculty of Medicine was concerned, the unreformed University of London was a teaching university. All candidates for degrees in medicine were required before presenting themselves for examinations subsequently to the preliminary scientific examination to produce certificates of instruction in recognised medical schools. Such medical schools were in fact though not in name, constituent colleges of the University and by means of such of their teachers as happened to be members of the Senate or university examiners these schools exercised a considerable, though indirect, influence both upon the curriculum and the examinations. It is undoubtedly due to these facts that the degrees in medicine alone, of all the degrees of the London University, were held in high esteem by the community at large as well as by graduates of other universities, and that the Faculty of Medicine, although without definite constitution, was the recognised chief power in the University. Thus it came to pass that the teachers of medicine in London, though suffering less disabilities than the teachers of any other subject and having less to gain by the change, were nevertheless the chief actors in the long struggle which led to legislation two years ago. To maintain the interest of the teachers in this wearisome contest against the strong party who resisted all reform it became necessary constantly to call attention to the grievances of the student of medicine who desired to obtain a degree in London. Whatever was not perfect in medical education in the metropolitan schools was attributed to the faulty constitution of the University. To strengthen the desire for reform imperfections were sought for and made much of, whilst their removal was confidently predicted by the reconstitution of the University, regardless of the fact that many of them were of collegiate and not of university origin. The complaint that has been constantly made in the medical press for the last 15 years or more that the education in the schools was not coördinated with the examinations of the University, and that consequently students of average ability could not reasonably expect to obtain medical degrees in London, was undoubtedly

necessary to provide the motive for reform. At the same time the publicity given to this statement has tended to lessen the entries of medical students in London and has thereby limited the finances of the schools and prevented them from maintaining their pre-eminence. Whether the reconstitution of the university will speedily effect the improvements in medical education that are anticipated depends upon the appreciation of the fact that so far as the Faculty of Medicine is concerned the step already taken is an exceedingly small one and in itself accomplishes very little. The schools of the University in all other faculties have by the reconstitution of the University been immediately placed in the position already occupied by the schools in the Faculty of Medicine. To the teachers in the schools of science, arts, and literature it may be enough to rest from their labours and allow natural development to take its own course. For the teachers of medicine to rest content with what has been already effected would be the surest way for them to lose the pre-eminent position which has naturally belonged to the metropolitan medical schools in the past but which has in recent years been seriously challenged by some of the provincial schools.

In the following paragraphs an attempt has been made to forecast the future work of the Faculty of Medicine and to estimate the fitness of the powers with which it has been entrusted to carry out such work thoroughly and speedily.

THE FACULTY OF MEDICINE: ITS COMPOSITION AND POWERS.

As originally constituted by the statutory Commissioners the Faculty of Medicine was composed of 150 members, consisting of the senior professional staff of the hospitals and the chief lecturers in the medical schools. One of the first acts of the Faculty was to draw the attention of the Senate to the fact that the selection of recognised teachers to be members of the Faculty which had been made by the Commissioners left much to be desired, and to request the Senate to admit to the faculty (1) every person recognised as a teacher of one of the subjects of "advanced medical studies"; (2) every person recognised, or provisionally recognised, as a teacher of one of the subjects of "intermediate medical studies"; and (3) at least one recognised, or provisionally recognised, teacher in each subject of "preliminary medical studies" from each school of the University in the Faculty of Medicine.

The Senate acceded to this request and as a result the Faculty as now constituted consists of about 350 recognised teachers of the various subjects of the medical curriculum. It is probably the largest body of medical teachers that has ever been officially constituted as a permanent committee to deal with questions of medical education. It contains men of world-wide reputation in connexion with nearly every subject of the medical curriculum and comprises representatives not only of every medical school but of the chief special hospitals in London. In addition to the powers delegated to this large body of men under the statutes of the University it will undoubtedly possess great influence over the constituent medical schools, over the medical profession, and when necessary over the general public. Upon the success of the Faculty in influencing the general public depends perhaps in greatest measure its power of improving medical education. Not only in London, but throughout the United Kingdom, the one most serious bar to the perfection of medical education is the complete indifference of the public to the fact that it is any concern of theirs. This indifference is due to a want of knowledge as to the needs of medical education. It is a primary duty of the Faculty of Medicine to make these needs known. Medical education, like every other form of higher education, requires endowment. It cannot be efficiently carried on without it. Endowment must be provided either by the State or by private munificence. On the continent of Europe endowment is provided by the State, where the education of each medical student costs his country between £20 and £50 per annum. In America assistance to medical education has in recent years been provided by the princely benefactions of private donors. To a certain very moderate extent the example of America has been followed by some of the provincial towns in the United Kingdom. In London medical education is entirely unendowed. The newly-constituted Faculty of Medicine of the University of London must see that its University is amply endowed and that a due proportion of its endowment is devoted to the furtherance of medical education. The public has become so accustomed to impose upon the medical profession the task of giving free service to the sick poor that it sees no injustice in demanding that the medical staff of the great hospitals shall also bear the burden of carrying on the education of medical students without endowment. It must be pointed out to the public that the burden is becoming intolerable, and there is no body of men to whom the public will be more disposed to give a sympathetic hearing than the physicians and surgeons who constitute the main portion of the Faculty.

The association together for the purpose of promoting medical education of representative teachers from each of the medical schools of the University should have the most salutary effect upon the schools themselves. The almost internecine struggle between the metropolitan schools of medicine should now cease. As constituent colleges of a great University the former rivalry of the schools must give place to concerted action in an endeavour to coördinate for the benefit of all students the unrivalled facilities for clinical investigation afforded by the greatest city of the world. Already there are encouraging signs that the University will break down the barriers between opposing schools and help them to appreciate that the prosperity of all is bound up with the prosperity of each. Working hand in hand, supplying each other's deficiencies, some specially developing their teaching in one direction, some in another, and all granting facilities to each other's pupils, these great hospitals in London may yet form a coherent centre of teaching worthy of their past records. With regard to this coördination and cohesion of the schools the Faculty of Medicine should exert great influence.

Another indirect effect that may be anticipated from the influence of the Faculty of Medicine is a diminution of the importance attached to examination in the scheme of education. It is perhaps an exaggeration to say, as some have done, that we are within measurable distance of regarding examinations with the respect paid to them by the Chinese, but few will deny that examination holds too high a place in general estimation. In no class of education is this more so than in medicine. It is inevitable that examiners should be selected from those who have formerly distinguished themselves as teachers and that Senates and other supreme educational boards should consist chiefly of those who are actively engaged as examiners rather than as teachers. The Faculty of Medicine is the only body in the University interested in medical education which contains a majority of teachers as opposed to examiners, and these teachers must make their power felt if the reconstituted University is to be a teaching university in fact as well as in name. Much of the above work the Faculty must achieve by indirect influence rather than by means of reports and recommendations officially presented to the Senate. In this more limited sphere there are, however, many important problems awaiting solution or only partially solved, and they will be briefly alluded to under separate headings.

ADMISSION TO THE UNIVERSITY: MATRICULATION.

The inadequate endowment of higher education in the United Kingdom and the rapid multiplication of universities are likely in the near future to give rise to serious problems. Inadequately endowed educational establishments can only manage to avoid bankruptcy by attracting large bodies of students, large classes being obviously more economically taught than moderate-sized ones. So long as the bait used to attract students is the renown of the professors and the high reputation of the degrees of the university the competition for students has only a good influence upon education. For an inadequately endowed university the temptation may arise to endeavour to attract students by requiring a low standard of preliminary education from those seeking admission to its colleges and by granting its degrees on easy terms. Such methods of competition amongst universities cannot fail to have the most disastrous effect upon education. There is some reason to believe that their operation may be already noticed in the case of certain universities so far as their medical degrees are concerned. They are more likely to take effect in the Faculty of Medicine than in any other faculty because degrees in medicine have a definite commercial value inasmuch as they admit their holders to the Medical Register and confer certain rights of professional practice. When so many important towns in the United Kingdom are clamouring for university charters it is well that this problem should be carefully considered. The Government should be prepared adequately to endow every local university to which it grants a charter, or at least should previously

satisfy itself that adequate endowment is forthcoming from private munificence. Failing this desirable way of placing universities beyond the temptation to compete unwisely for students, medical education might be saved from the evil effects of such competition by the establishment of a single State examination for admission to the Register. Meanwhile, one of the first duties of the reconstituted University of London has been to determine the conditions under which it would admit undergraduates within its gates. On all hands it was agreed that there should be no lowering of the standard of preliminary education required of students seeking admission. It was decided that as in the past a matriculation examination conducted by the University itself should be imposed upon all candidates except those already possessing degrees in certain selected universities. The nature of this examination has, however, been the subject of prolonged controversy. The regulations for the examination as finally approved are printed below. In deciding upon the subjects and scope of the examination the Senate had the advantage of the assistance of a special advisory board containing such valued representatives of secondary education as the headmasters of several public schools, and the scheme finally adopted differs but little from that originally drafted by this body. It may therefore be confidently hoped that the new matriculation examination will be more acceptable to public schoolmasters than was its predecessor. The Faculty of Medicine, when asked by the Senate to report upon the question of the matriculation examination, laid stress upon the fact that the old style of examination was so out of line with the education in the ordinary schools that many boys of more than average ability were obliged to leave the best public schools and to be privately coached before submitting themselves for the test. The Faculty, therefore, reported "that no scheme of matriculation will be satisfactory which does not provide a wide choice of subjects for examination so as to meet the requirements of candidates whether from the classical or modern side of secondary schools." Such a wide choice is now provided, and although there is a fear expressed by some lest intending students of medicine should make an unwise choice there can be no doubt that a judicious widening of the gate of the University will have a good influence upon education. Single-handed no university can alter the course of study pursued in our secondary schools, and the efforts of the old London University in this direction have had but the smallest effect upon preliminary education, while they have led to the exclusion from the University of many very desirable students whose school work had not been conducted upon the exact lines laid down by the Senate. The Faculty of Medicine may congratulate itself that it has taken an active part in removing what has for years been regarded as one of the chief obstacles to a reasonably accessible degree for London medical students. At the same time those who have regarded the old matriculation examination as the "goal of secondary education and the gate of the University" may derive some satisfaction from the knowledge that the Senate is taking active steps in coöperation with other universities to establish "school-leaving" examinations. A well-considered joint scheme of "school-leaving" examinations conducted by several universities should be a very valuable means of coördinating and systematising secondary education throughout the country.

PRELIMINARY AND INTERMEDIATE MEDICAL STUDIES.

"*The Senate shall use its best endeavours, whenever practicable, to secure common courses of instruction for internal medical students in the preliminary and intermediate portion of their studies under appointed or recognised teachers at one or more centres.*"

These are the words of one of the clauses of the new statutes of the University and it is no exaggeration to say that so far as medical education in London is concerned the Senate has no more important task to perform than the satisfactory solution of the problem thus entrusted to it. The statutory Commissioners frankly stated that they considered the need of concentration of preliminary and intermediate medical education to be clearly established and that they would have preferred to have themselves framed statutes for at once effecting it. To have done so would too long have delayed the publication of the statutes and they therefore "empowered and recommended the Senate to proceed as soon as may be in the desired direction." One of the first acts of the Faculty of Medicine was to elect three members to represent it on the Senate. The choice of these senators was in great measure determined by the wish of the Faculty that its representatives should be prepared to impress upon the Senate the desirability of carrying out the recommendation of the Commissioners with regard to concentration. Little time was lost in calling attention to the statute relating to this subject and in moving the senate to refer the matter to the Faculty of Medicine. The Faculty conferred with the medical schools and found, as the Commissioners had stated, that there was no consensus of opinion in regard to the mode in which concentration should be carried out. Nevertheless, a committee of the Faculty was able to draft a report containing a specific recommendation that the first step should be taken by establishing in the near neighbourhood of the University a school of anatomy, physiology, biology, and chemistry under conditions which so far commended themselves to the Faculty that the report was adopted without dissent for presentation to the Senate. This first stage in the proceedings was reached in December, 1901. Since that time the Senate and the Faculty have been in conference upon the provision to be made in the proposed school and it is probable that early next session an appeal will be made to the public for funds for its establishment. Should the response be sufficient to enable the University to carry out the wishes of the Faculty there will be established in London an institute of medical sciences second to none in the United Kingdom, and one to which the metropolitan hospitals will be able with confidence to entrust the preliminary training of their students. Such opposition as still exists to "concentration" depends on a fear lest in the two or three centres to be established the teaching of anatomy and physiology should be less well done than it is at present in the 12 competing schools. The report of the Faculty on the accommodation and staff of the proposed institute should do away with any fears of this kind and enable the teachers in the schools to feel that they cannot more certainly promote the welfare of their students than by helping the University to secure the funds to build and to endow the institute. For not only will the accommodation and facilities for study in the new institute surpass those at present provided in the medical schools, but, relieved of the necessity of teaching these earlier subjects, the schools will be enabled to develop the teaching of the clinical period.

ADVANCED MEDICAL STUDIES.

"*The Senate may make arrangements with the Royal College of Physicians of London and the Royal College of Surgeons of England, or either of them, to conduct jointly with the Senate examinations in such portions of the subjects included in the course of study for a medical degree as may be agreed upon between the Senate and these Colleges, or either of them.*

Last year we called attention to this permissive clause in the statutes and urged that advantage should be taken of it as soon as possible. It is satisfactory that the question is now under consideration by all three bodies concerned. If some feasible method of diminishing the number of examinations for the London student of medicine who desires to obtain both the university degree and the college diplomas can be arranged it will be of great assistance to the authorities of the schools. The constant interruption of systematic study caused by numerous examinations is a great stumbling-block to education. During the five years' medical curriculum a student without once being referred may under existing conditions present himself for 14 separate examinations in order to obtain the conjoint diploma and the university degrees.

It is hardly necessary to indicate the improvements that will be made in the clinical period of study in the schools of the London University when they are freed from the burden of the earlier subjects of education and their students' course of learning is less interrupted by preparation for a multitude of examinations. The laboratories of physiology and chemistry will be devoted to experimental and clinical pathology, to bacteriology, and to pathological chemistry. By coöperation with the special hospitals, and possibly also with the workhouse infirmaries, the course of clinical instruction may be amplified and made more illustrative of the vast material available amongst the 5,000,000 inhabitants of the metropolis. With well-equipped clinical laboratories and with wards filled with cases selected with due regard to educational needs there is no doubt that the high standard of teaching for which the London medical schools have

been noted will be maintained and enhanced by their closer association with what is destined to become one of the greatest of modern universities.

The new regulations for the Matriculation Examination did not reach us in time to be inserted in our Students' Number of August 30th. They are now printed below.

NEW REGULATIONS FOR THE MATRICULATION EXAMINATION.

The following indicates the general scope of the new Matriculation Examination for all students. The first examination under the new regulations commenced on Sept. 15th. An examination under the old regulations will be held in January, 1903, and under both sets of regulations in June, 1903. Candidates shall not be approved by the examiners unless they have shown a competent knowledge in each of the following subjects, according to the details specified under the several heads:—1. English. One paper of three hours. 2. Elementary mathematics. Two papers of three hours each. 3. Latin, or elementary mechanics, or elementary physics (heat, light, and sound), or elementary chemistry, or elementary botany. One paper of three hours in each subject. 4. Two of the following subjects, neither of which has already been taken under (3). One paper of three hours in each subject. If Latin be not taken, one of the other subjects selected must be another language from the list, either ancient or modern:—

Latin.
Greek.
French.
German.
*Arabic.
*Sanskrit.
*Spanish.
*Portuguese.
*Italian.
*Hebrew.
History, Ancient or Modern.
Logic.
Physical and General Geography.
Geometrical and Mechanical Drawing.
Mathematics (more advanced).
Elementary Mechanics.
Elementary Chemistry.
Elementary Physics:—
(*a*.) Heat, Light and Sound, or
(*b*.) Electricity and Magnetism.
Elementary Biology:—
(*a*.) Botany, or
*(*b*.) Zoology.

* Candidates for examination in these subjects must give at least two months' notice.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN 76 of the largest English towns 8233 births and 4683 deaths were registered during the week ending Sept. 13th. The annual rate of mortality in these towns, which had been 15·2 and 15·9 per 1000 in the two preceding weeks, further rose to 16·4 per 1000 last week. In London the death-rate was 16·8 per 1000, while it averaged 16·2 in the 75 other large towns. The lowest death-rates in these towns were 6·9 in King's Norton and in Halifax, 7·2 in Burton-upon-Trent, 7·6 in Hornsey, 8·5 in Handsworth, 8·9 in Leicester, and 9·2 in Smethwick and in Blackburn; the highest rates were 21·8 in Middlesbrough, 22·5 in Preston, 23·0 in St. Helens, 23·9 in Liverpool and in Warrington, 25·0 in Tynemouth, 25·5 in Portsmouth, and 26·6 in Merthyr Tydfil. The 4683 deaths in these towns last week included 1062 which were referred to the principal infectious diseases, against 638, 743, and 895 in the three preceding weeks; of these 1062 deaths 704 resulted from diarrhœa, 107 from whooping-cough, 85 from measles, 63 from diphtheria, 54 from "fever" (principally enteric), 45 from scarlet fever, and four from small-pox. No death from any of these diseases was registered last week in Burton-upon-Trent, King's Norton, Rochdale, or South Shields; while they caused the highest death-rates in West Ham, Portsmouth, Birkenhead, Wigan, St. Helens, Preston, and Merthyr Tydfil. The greatest proportional mortality from measles occurred in Newcastle-upon-Tyne and Bristol; from diphtheria in Portsmouth and Wigan; from whooping-cough in Hanley; from "fever" in Ipswich; and from diarrhœa in Bootle, Merthyr Tydfil, Willesden, Plymouth, Preston, Birkenhead, St. Helens, and Portsmouth. Scarlet fever did not show a marked excess in any of the towns. Two fatal cases of small-pox were registered in London and two in West Ham, but not one in any other of the 76 large towns. The number of small-pox cases under treatment in the Metropolitan Asylums hospitals, which had been 128, 109, and 95 at the end of the three preceding weeks, further declined to 71 at the end of last week; seven new cases were admitted during the week, against 18, 11, and 12 in the three preceding weeks. The number of scarlet fever cases in these hospitals and in the London Fever Hospital, which had been 2623, 2651, and 2713 on the three preceding Saturdays, declined again to 2669 on Saturday, Sept. 13th; 311 new cases were admitted during the week, against 296, 295, and 333 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had been 136, 139, and 123 in the three preceding weeks, rose again last week to 134, but were four below the corrected average number. The causes of 46, or 1·0 per cent., of the deaths in the 76 towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Portsmouth, Bristol, Bolton, Salford, Bradford, Leeds, Sheffield, Newcastle-upon-Tyne, Cardiff, and in 47 other smaller towns; the largest proportions of uncertified deaths were registered in Smethwick, Blackburn, Preston, and Sunderland.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had been 14·4, 14·0, and 13·9 per 1000 in the three preceding weeks, rose again to 14·8 per 1000 during the week ending Sept. 13th, and was 1·6 per 1000 below the mean rate during the same period in the 76 large English towns. The rates in the eight Scotch towns ranged from 6·6 in Leith, 12·5 in Perth, and 12·9 in Greenock, to 14 5 in Edinburgh, 16·1 in Glasgow, and 16·7 in Paisley. The 479 deaths in these towns included 21 which resulted from diarrhœa, eight from scarlet fever, seven from measles and from whooping-cough, five from diphtheria, and four from "fever." In all, 52 deaths were referred to the principal infectious diseases last week, against 52, 45, and 54 in the three preceding weeks. These 52 deaths were equal to an annual rate of 1·6 per 1000, which was 2·1 per 1000 below the mean rate last week from the same diseases in the 76 large English towns. The fatal cases of diarrhœa, which had been 22, 14, and 31 in the three preceding weeks, declined to 21 last week, of which 11 occurred in Glasgow and four in Dundee. The deaths from whooping-cough, which had been 17 and eight in the two preceding weeks, further declined to seven, and included four in Glasgow. The fatal cases of measles, which had been five, four, and six in the three preceding weeks, rose to seven last week, of which three were registered in Edinburgh and two in Glasgow. The deaths from "fever," which had been four and six in the two preceding weeks, declined again to four last week, and included three in Glasgow and one in Edinburgh. The deaths referred to diseases of the respiratory organs in these towns, which had been 68, 54, and 61 in the three preceding weeks, further rose last week to 82, and were slightly in excess of the number recorded in the corresponding period of last year. The causes of four, or nearly 1 per cent., of the deaths registered in these eight towns were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 20·6 and 22·7 per 1000 in the two preceding weeks, again declined to 19·1 per 1000 during the week ending Sept. 13th. During the past four weeks the death-rate has averaged 20·5 per 1000, the rates during the same period being 16·0 in London and 13·9 in Edinburgh. The 139 deaths of persons belonging to Dublin registered during the week under notice included 38 which were referred to the principal infectious diseases, against 24 and 28 in the two preceding weeks; of these 19 resulted from diarrhœa, 6 from measles, three from "fever," and two from diphtheria, but not one from small-pox, scarlet fever, or whooping-cough. These 30 deaths were equal to an annual rate of 4·1 per 1000, the death-rates last week from the same diseases being 4·1 in London and 1·8 in Edinburgh. The fatal cases of measles, which had been 16, 11, and 10 in the three preceding weeks, further declined last week to six. The deaths from diarrhœa, which had been three, seven, and 10 in the three preceding weeks, further rose to 19 last week. The mortality from both diphtheria and "fever" was the same as that recorded in the preceding week. The 139 deaths in Dublin included 48 of children under one year of age and

26 of persons aged upwards of 60 years; the deaths of infants considerably exceeded the number in the preceding week, while those of elderly persons showed a slight decrease. Six inquest cases and four deaths from violence were registered; and 42, or nearly one-third, of the deaths occurred in public institutions. The causes of seven, or 5 per cent., of the deaths registered in Dublin were not certified.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Fleet Surgeon E. J. Biden to the *President* for recruiting duties and medical department, temporary. Surgeons: P. T. Sutcliffe to Gibraltar Hospital; J. S. Dudding to the *Hibernia* for the *Maine*; G. Taylor to the *Antelope*; G. R. MacMahon and Ramsey M. Richards to the *Vivid*; Albert X. Lavertine to the *Lizard*; and Edwin S. Miller to the *Impregnable*.

ROYAL ARMY MEDICAL CORPS.

Major S. C. Philson proceeds to the South-Eastern District for duty. Captain F. S. Brereton will shortly embark for service in India. Major J. H. E. Austin embarks for Singapore for service in the Straits Settlements. Lieutenant-Colonel J. R. Dodd proceeds to the Woolwich District pending embarkation for service abroad. Lieutenant-Colonel G. Coutts is appointed Staff Officer to the Principal Medical Officer, Second Army Corps. Lieutenant-Colonel D. L. Irvine embarks for service in India. Captain G. S. Mansfield is ordered to proceed to the Home District for duty with the Grenadier Guards, in succession to Major J. H. E. Austin. Major S. Hickson is appointed to the medical charge of the Hospital for Soldiers' Wives and Children at Devonport and Lieutenant-Colonel R. J. Fayle, D.S.O., is selected for duty in the Western District.

Lieutenant-Colonel William H. Allen retires on retired pay. Dated Sept. 17th, 1902.

ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Major G. R. Gilruth having resigned his Volunteer appointment, ceases to belong to the Army Medical Reserve of Officers. Dated Sept. 17th, 1902.

Surgeon-Captain F. W. Grant to be Surgeon-Major. Dated Sept. 17th, 1902.

MENTIONED IN DESPATCHES.

The *London Gazette* of Sept. 12th publishes a series of despatches relating to the Lango Expedition against the Soudanese mutineers in which the "greatest credit" is given to "Dr. Bagshawe for having, under the most adverse circumstances, successfully battled with the outbreak of small-pox which unfortunately broke out and so greatly hampered the movements of the force." Major C. Delmé-Radcliffe, the officer commanding the Lango Field Force, referring to Dr. Bagshawe, says: "I cannot speak too highly of this gentleman or of the manner in which he performed the very hard work which fell to his share. He was never sick, whenever required he accompanied the troops any distance on foot, and he was wonderfully painstaking and successful in his treatment of his patients, black and white alike, and they numbered hundreds daily. He acquired a well-deserved measure of popularity with the whole force and I think the Uganda Protectorate is to be congratulated in retaining the services of so able and zealous a medical officer."

In a despatch relating to the Aro Field Force in Southern Nigeria the High Commissioner says:—

"The medical staff was organised from the civilian staff of the Protectorate by the principal medical officer, Dr. Robert Allman, and was augmented by a medical officer, Dr. Brook, accompanying the Northern Nigerian Contingent, and a medical officer, Dr. Hadley, specially engaged to accompany the Lagos Column. The organisation of the medical staff in the field was, I understand, found to be thoroughly efficient at all times, and of that of the Base Hospitals I can speak personally, having visited and inspected them on several occasions. The organisation was, I consider everything that could be desired in this direction, and when the difficulties of transport, especially of the wounded, is considered it will be understood that there was great difficulty in rendering them of practical assistance. Such hospitals were, during the conduct of affairs, established at different times at Itu, Opobo, Degama, Aro-Chuku, and Bende. I consider that Dr. Allman is deserving of great credit for the successful manner in which he organised his department.

I would bring the name of Dr. A. H. Hanley, senior medical officer of the Civil Medical Staff of this Protectorate, to your notice for favourable consideration on account of services rendered in the field when accompanying columns. This officer volunteered to come out from England to assist in the operations, though his leave was but half completed. His devotion to his work and care to the sick and wounded, of whom he appeared to have had more than his share, was remarked by every one connected with the force, and he is, I consider, the officer, as representing the medical department, whose services are deserving of special mention. I should, however, point out that all civilian doctors who volunteer to take part in the operations of this nature are deserving of great credit, for they have little or nothing to gain thereby, and suffer in nearly all cases pecuniary loss in the matter of private practice."

Lieutenant-Colonel A. Montanaro, who commanded the Aro Field Force, states that—

"Dr. R. Allman, C.M.G., who was principal medical officer, not only made excellent arrangements before the expedition, but supervised the carrying out of them to my entire satisfaction, and it is mainly due to his forethought that abnormally good health prevailed among the Europeans and natives of the force.

Dr. A. H. Hanley performed his duties as senior medical officer with great devotion. I have never met a more attentive or conscientious medical officer."

The name of Surgeon-Captain W. Fletcher, D.S.O., Royal Army Medical Corps (Militia), is also mentioned.

HOME FROM THE WAR.

The large number of soldiers who have already arrived, and are still arriving, in this country from South Africa to be discharged the service form a difficult problem to deal with. Apart from those who from disablement from wounds or sickness are unable to earn a livelihood but are deserving of every consideration there are a still larger number of men who are seeking, but unable to find, employment. It goes without saying that the Government and large firms and employers of labour are desirous of doing their best for these men, but it is nevertheless not by any means easy to find employment for them. As regards those who are suffering from the results of sickness or disablement directly attributable to the war and field service, it is the obvious duty of everyone to help them as far as practicable. With every desire in the world to treat the Boers with all possible generosity and friendliness as fellow subjects of the King it must nevertheless be acknowledged that there was a good deal of force and common-sense in what the Marquis of Londonderry said in speaking at Stockton-on-Tees on behalf of the Soldiers' Help Society: "He could not but think that the crowds which had during the past few weeks in the neighbourhood of London and in the South of England cheered the Boer Generals, who were mainly responsible for the prolongation of the war and its attendant misery and sorrow, would have been much better employed in seeking to give practical and material assistance to their own gallant countrymen who had fought and bled in South Africa."

WHAT THE SOUTH AFRICAN ARMY MEANT.

We referred very briefly last week to the total losses sustained during the war in South Africa from wounds and injuries and from disease. It appears that the military forces in South Africa from 1899 to the end of July, 1900, that is to say from the beginning to the end of the war, according to the recently issued Parliamentary return, amounted altogether to 265,132 (officers and men). Of the reinforcements 337,219 were sent out from home, 18,534 from India, 30,328 from the colonies, and 52,414 raised in South Africa—making up a total of 438,495. This is more than eight times the number of a single army corps (52,000), which was considered at first to be sufficient. Apart from the lists of killed and wounded in numerous engagements published during the war, those of deaths from disease were first issued in December, 1899, and were regularly continued throughout the war. The last recorded death in action was three days after the declaration of peace.

NEW ROYAL ARMY MEDICAL CORPS WARRANT.

An Army Order, dated Sept. 1st, just issued, contains a Royal Warrant relating to the medical officers of the Household troops. It sets forth that commissions as surgeon-lieutenants in the Household Cavalry shall be given, on the nomination of the titular colonels of the regiments, to persons approved by the Secretary of State. Lieutenants and captains of the Royal Army Medical Corps attached to regiments of the Household Cavalry at the date of the warrant may, on the nomination of the titular colonels of the regiment, be transferred thereto in the rank of surgeon-lieutenant and surgeon-captain respectively. A major or lieutenant-colonel of the Royal Army Medical Corps may, on the nomination of the titular colonel of the regiment, be transferred from his corps into the rank of surgeon-major or surgeon-lieutenant-colonel respectively in one of the regiments of Foot Guards.

OFFICERS' MESSES.

A circular has been sent out by the War Office notifying that it has been decided to furnish at the public expense officers' messes and the quarters of unmarried officers of field and lower ranks at the home stations. Each officer on joining the service will be supplied with a field-kit free of charge but to be kept up at his own expense. The kit consists of a portable wood camp bedstead with canvas bag for the same, three blankets, tripod, washstand, camp chair, pillow, valise for bedding, canvas waterproof, wash-basin, bath, and bucket.

THE MEDICAL DEPARTMENT OF THE WAR OFFICE.

Our service contemporary, the *Army and Navy Gazette*, understands that there is every chance of the Medical Department of the War Office, now at 18, Victoria-street, being shortly removed to a more commodious building in the same street.

Looking Back.

FROM

THE LANCET, *SATURDAY, SEPT. 18*, 1824.

To the Editor of THE LANCET.

SIR,—The reason I address you on this subject may, at first sight, not a little surprise you: but there really is nothing known to the medical profession of hydrophobia, in fact, all our present means are totally inadequate to cure this direful malady. Two cases, within this last week, have occurred to my knowledge; one I had every opportunity of watching, the other at Guy's, which you, no doubt, will notice. There did not appear, in either of the above cases, any very evident diminution of the disease from the treatment employed, and so it has been for ages past, and so will continue, unless something be done or something found out to overpower this great and determined enemy of the "healing art." But on account of the death of the first case (which became, almost directly, known in every neighbouring part), a man who resides at Wing, in Buckinghamshire, (at the request of some private individual in town, who had heard of his notoriety, entirely unconnected with the deceased) came to the friends of this poor mortal, and declared that, had he seen the man a few hours before his death, he would have cured him. This, of course, was thought almost too contemptible for notice; however the man made his appearance, and I, of course, conversed with him on the point in question, and he declared that he would venture his life on any case, if he administered his medicine or saw it administered to the patient. He gave me several cases to read, one where two apothecaries, after a variety of means, had come to the determination of bleeding the patient to death; but someone who had seen the case, and also knowing this man, had him directly sent for, and the patient was placed under his treatment and recovered, and is now living, with many others in that neighbourhood, to attest the fact, where the man has also lived since his birth. If this, hereafter, should be found correct, what neglect and blame will be attached to the names of these medical men. Think not that I am coming forward to espouse the cause of quackery, for I assure you no one detests the traffic more than myself. But here stands the monster which defies all our power—the innumerable remedies we have proposed have all proved futile without exception, therefore he who brings forward a cure is not only entitled to the highest encomiums of the medical profession but of the world, and I do think it would be justifiable in any man's trying this remedy.

I remain, Sir, &c.,

Sept. 14th. J. H.

P.S. The man's name is Thomas Newens.

Notwithstanding the conviction of our correspondent to the contrary, we fear that the assertions of Mr. THOMAS NEWENS are the boastings of an interested quack; if they are not, how can he reconcile it to his conscience to quietly witness the destruction of so many of his fellow-creatures, when the publication of his remedy might rescue the sufferers from the agonizing tortures of the most terrible of all diseases.

Correspondence.

"Audi alteram partem."

A PLEA FOR THE MORE FREQUENT USE OF CHLOROFORM IN LABOUR.

To the Editors of THE LANCET.

SIRS,—When Sir James Simpson first introduced chloroform into general use in Scotland, and particularly in connexion with midwifery, its administration was vigorously opposed by a large section of the public, and some of the old prejudice against its use still exists. This prejudice I am sorry to say is not entirely confined to laymen. I have heard medical men condemn in unmeasured terms the growing tendency to the free administration of chloroform in labour. They maintain that it should not be given, except in cases of difficulty, and they raise objections to it most of which appear to have their origin in a want of knowledge and practical training. For 10 years I have used chloroform in all kinds of cases, having given it many hundreds of time and upon every possible occasion, and I have never yet seen it give rise to any untoward symptoms. I go so far as to say that every accoucheur should educate his patients to its use, for in these matters, as in most others, progress can only be made according to the rate at which people are educated and prepared to receive its advantages. Everybody knows that a large majority of cases if left to nature will end satisfactorily as far as the safety of both mother and child is concerned. But by judiciously assisting the process the accoucheur can do more than this: he can bring about the same happy result without permitting the mother to suffer all the agonising torture associated with parturition. It is undoubtedly the case that the conditions of modern life have influenced the process of parturition to an enormous extent. The mental as well as the physical torture in many cases is so extreme as to make it appear almost unnatural. Many instances have come under my own observation where the dread of a former parturition has caused much domestic unhappiness and has placed an absolute restriction upon reproduction. These are painful and difficult cases which most medical men meet with sooner or later and they should be overcome by assurances that the trials of labour can be alleviated in a great measure by rational treatment and management. The assurances can be carried into effect by the judicious use of chloroform. Not only will the pain be relieved but the mother's strength and energy will be conserved by preventing the unnecessary mental anxiety, muscular straining, and exhaustion. To appreciate this one has only to note the contrast in the immediate after-results between a case left to nature and a case in which chloroform has been judiciously administered. In the former we find, as a rule, and almost always in highly nervous women, careless exhaustion and indifference to her surroundings, whilst in the latter you have a patient in good spirits, vigorous, and keenly interested in everything. In the latter, also, which is a matter of the greatest importance to those highly sensitive women, the labour is robbed of almost all its painful after memories.

That anæsthetics are not more frequently employed in midwifery practice is not surprising when one considers the very imperfect practical training most men get in this important branch of their work in the various teaching centres. If medical students were instructed how to use and to administer chloroform in a practical way, and were at the same time urged to use it in midwifery cases upon every possible occasion, mothers would have less cause to dread their confinements. It is manifestly absurd that a student should never have the opportunity of giving chloroform to such cases as he may attend before qualification, when immediately afterwards he may be called upon to do so in difficult cases where he cannot get help. If chloroform is given with a knowledge of what is required—a knowledge which can be obtained by practical lessons only—there is not the least danger in its administration in confinements. I have not seen a case recorded where death was due to chloroform in such circumstances. It should be remembered that, in addition to the intermittent administrations, surgical anæsthesia is seldom required, and that the maternal heart, owing to certain changes due to pregnancy, is in a better and safer condition for the chloroform anæsthesia.

The most important argument against the use of chloroform in labour is the objection that it is said to interfere with normal uterine contractions. There is no doubt whatever that if it is given, as is suggested by some, to the surgical extent as the head passes over the perineum it will interfere with normal contraction. But this is the abuse of chloroform and not its use. If it is given on the open towel system, or any other system permitting a free admixture of air, and given intermittently and just before the onset of a pain, with few inhalations between the pains, the influence over the uterine contractions is very slight, if, indeed, there is any at all. The little influence it may have is in my opinion beneficial. The onset of the contraction is not quite so sudden, but the frequency and force are maintained throughout. The relaxing influence exerted on the soft parts, the freedom from struggling and unnecessarily contracting the muscles of the limbs and elsewhere, all help to render the uterine contractions more effectual and less painful. The abdominal muscles are very slightly influenced and continue to play their part as the uterus begins to contract. If chloroform be given to the surgical extent and continued—a proceeding quite uncalled for in ordinary labour—the interval is lengthened, the force and duration are diminished, and, finally, the pains stop. An important point, however, is the fact that even when deeply under its influence the uterus will contract as soon as it is emptied, but this contraction is not always a reliable one.

Chloroform administration does not predispose to post-partum hæmorrhage unless it is given in complete ignorance of what is required and given with gross carelessness. If the absurd advice is followed of keeping back chloroform until the head is about to pass out and then give it to the surgical extent one is courting danger. The exhaustion produced by this proceeding is greater than the exhaustion of leaving the case to nature to finish. In an ordinary case there is absolutely no necessity to give chloroform to the surgical extent at any time during the labour. I have never yet seen a case of post-partum hæmorrhage associated in any way with the rational administration of chloroform. I would not hesitate to give it in a case with a predisposition to hæmorrhage, as I believe it would be beneficial if given judiciously from the fact of its conserving the strength and preventing nervous exhaustion, for the loss of the former and increase of the latter have, in my opinion, much to do with the production of post-partum hæmorrhage. The objection brought against chloroform that it is difficult to limit its action only holds good in very serious cases where prolonged surgical anæsthesia is required. Rest from pain, muscular straining, and mental anxiety can be obtained whilst the anæsthetic is entirely under the control of the administrator. My advice to young practitioners in midwifery work is to give chloroform upon every possible occasion until they are thoroughly acquainted with its administration and to give it in the normal cases so as to be prepared for the abnormal. In cases of rigidity of the os, in the treatment of which the virtues of chloral have been so highly extolled, I would advise a trial of intermittent inhalations of chloroform preceded by a small hypodermic injection of sulphate of morphia.

In nervous women and those of highly developed intellect pain produces marked exhaustion and irregular muscular contractions which I believe seriously interferes with the normal uterine contractions in labour. In these cases we find the most clearly demonstrated benefits of chloroform. After a few inhalations the pains become much more regular and owing to the relaxation of the soft parts under its influence the labour proceeds much more satisfactorily. Chloroform, or some mixture containing chloroform, is the best anæsthetic in midwifery. Ether is not practicable for single-handed work and is much more objectionable to the patient when given intermittently.

I am, Sirs, yours faithfully,

T. W. PARKINSON, M.D. Edin., D.P.H. Aberd.

Sloane-street, S.W., Sept. 8th, 1902.

THE LOW PHOSPHATES AND UREA IN THE URINE OF THE TUBERCULOUS.

To the Editors of THE LANCET.

SIRS,—The perusal of Dr. H. Harper's letter in THE LANCET of Sept. 13th, p. 776, on the deficiency of urea in the urine of tuberculous patients leads me to offer a few remarks on this subject. During a pretty long experience among tuberculous patients in Victoria Park Chest Hospital and elsewhere I have noticed how very rarely gout and phthisis are found together. More than once I have come across tuberculous consumption coming upon a patient who years before had been subject to gout. Gout had quite left him and serious tuberculous disease had taken its place. Free feeding and a fair allowance of alcohol is a method of treatment that certainly answers well in many consumptive cases. Dr. Walshe, in his lectures at University College, I remember, used to refer to cases of consumptive people who had gone in for rather free drinking and to the surprise of most who observed them found their lung symptoms to improve though there was no evidence of actual gout coming on. Our good lecturer used to add for the benefit of his hearers: "Do not let this statement lead any of you into dangerous ways." I have thought at times whether the administration of uric acid or urea to the consumptive with a view to producing gout might be a good therapeutic step, but I have never tried either of these bodies.

Many years ago the late Dr. Hastings of Albemarle-street gave urate of ammonia, obtained from the pythons' house at the Zoological Gardens, for the cure of consumption and maintained his case so well before the Censors' Board at the College of Physicians that the late Dr. T. K. Chambers was induced to try this curious remedy at St. Mary's Hospital under the name of "Mistura Pythonis," but the result of its administration was not encouraging, it seeming to have no action, either for bad or good, on the patients.

I am Sirs, yours faithfully,

JOHN C. THOROWGOOD, M.D., F.R.C.P. Lond.,
Consulting Physician to Victoria Park Chest Hospital, and to the Royal National Hospital for Consumption at Ventnor.

Bognor, Sept. 13th, 1902.

THE IMPUDENCE OF CERTAIN ADVERTISING DRUGGISTS.

To the Editors of THE LANCET.

SIRS,—I enclose a copy of correspondence relating to "The Lancet Influenza Cure" with which my name was associated.[1] My attention has also been called to an advertisement of Kutnow's powder in the *Philadelphia Medical Bulletin* in which my name appears with a number of others around a portrait of the late Mr. Lawson Tait as distinguished endorsements. All the English physicians and surgeons pilloried with me are dead and their memory can be desecrated with impunity. I enter a protest against this detestable practice in their name and my own.

To attribute to me any endorsement of Kutnow's powder is particularly unfortunate. I have never ordered a single dose of it, but, on the contrary, have frequently had to point out that the habitual use of this and similar aperients is often most injurious and that the relief of constipation may be purchased very dearly. The use of my name as recommending Kutnow's powder is, as in the case of "The Lancet Influenza Cure," a fraud upon the public and an insult to myself.—I beg to remain, your obedient servant,

W. H. BROADBENT, M.D., F.R.S.

Brook-street, W., Sept. 16th, 1902.

INSANITY AND LONG SEA VOYAGES.

To the Editors of THE LANCET.

SIRS,—The excellent advice of Dr. Louis Vintras on insanity and long sea voyages in THE LANCET of Sept. 13th (p. 775) deserves a very great deal of thoughtful attention on the part of the profession. More particularly does it concern the family physician who is often first consulted on the matter. The curative effects of the ocean climate in certain diseases, such as, for instance, consumption, bronchitis, asthma, the after-effects of inflammation of the lungs, pleurisy, &c., are familiar to all of us. The various health voyages, the time of starting, the choosing a ship, the preliminary arrangements, the life at sea, the course, climate, and weather, and, not least, the management of the health at sea, are knotty points for him who seeks "the ocean as a health resort." Again, occupations and amusements, objects of interest at sea, future plans, and

[1] See special article on "Impudent Quacks and the Title of THE LANCET" on page 829 of our current issue.—ED. L.

the end of the voyage all combine to make a sea trip pleasant or unpleasant. It is probable, too, that the rapid improvement in the class of cases I have named is due to the following causes: (1) enforced rest and change of scene; (2) the constant respiration of pure air free from inert impurities and which is only to be found in sea air; (3) open-air treatment; (4) greater equability of temperature and the soothing effect of "ozone" on the constitution; (5) certain specific substances in sea air; (6) changes of climate through the different "regions" of the ocean. These above conditions are what we realise in our mind when we contemplate sending to sea a patient of the class likely to derive benefit.

Nervous complaints are so numerous and varied in their manifestations that they can only be spoken of generally. It may, however, be stated broadly that for all those anomalous affections of the nervous system that are not accompanied by any actual disease of the brain or spinal cord, but which are often dependent either upon mental causes or derangement of the digestive organs, we have in a sea-voyage a most valuable and successful mode of treatment. In fact, there are no cases in which, as a rule, the effects of sea-life are more strikingly beneficial than in these. The change of scene, the different mode of life, and the varied social conditions, usually exercise the most cheering influence, not only upon the bodily health but also (which is equally important in complaints of this class) upon the mental state; so that the nervous patient, after a month or two at sea, is often altogether a different being from what he was when he sailed.

But with regard to the more serious diseases of the nervous system, such as paralysis, epilepsy, melancholia, and mania, it is necessary to speak much more guardedly; and it is only after all the circumstances of such a case have been carefully weighed by the medical man in attendance that it will be possible to form a decided opinion as to the advisability of a sea voyage. This extract from a sailor's log speaks for itself. Having circumnavigated the ocean on more than one occasion I speak with some authority. It is well to know the "ropes" and to be experienced before one gives an opinion. Nevertheless, it is a good excuse to send a person of unsound mind to sea when you want to get rid of him. But the most honourable action, as a rule, is to advise the detention of a person of unsound mind in a residential home where he will have a better chance of recovery.—I am, Sirs, yours faithfully,

Alton, Hants, Sept. 13th, 1902. J. F. BRISCOE.

A DISCLAIMER.

To the Editors of THE LANCET.

SIRS,—The *British Medical Journal* published last week a short note by me on the use of paraffin for restoring the bridge of the nose. Some of the daily papers have made "copy" of it, and have named me as though I had invented the method. I wish to say that I had nothing whatever to do with the matter and I wish it could have been prevented.—I am, Sirs, yours faithfully,

Sept. 15th. STEPHEN PAGET.

A MEDICAL ASPECT OF THE EDUCATION BILL.

To the Editors of THE LANCET.

SIRS,—In order that education should be efficient it is surely necessary that the children should be in the best possible condition for receiving it. It has long been known that the eyes of our board school children are defective and the recent discussion at the Otological Society clearly showed that the ears and throats urgently require attention. Apart from the special senses I would ask, Does not the general condition of the children, especially as regards communicable diseases such as those of the skin and tuberculosis, require supervision? If a child is compelled by law to attend school the parents have a right to demand that the child runs no risk by so doing. The subject has been thoroughly recognised in some countries—Germany and Switzerland, for example—where every child is medically examined on entering the schools and all defects are, as far as is possible, rectified. Such examination and treatment must be of the greatest value from the educational standpoint and must add to the physical and intellectual vigour of a nation. It seems clear that some system is necessary in this country.

I am, Sirs, yours faithfully,

Savile-row, W., Sept. 15th, 1902. ARTHUR H. CHEATLE.

THREADWORMS AND APPENDICITIS.

To the Editors of THE LANCET.

SIRS,—In an annotation in THE LANCET of Sept. 6th, p. 687, the occasional discovery of threadworms in the appendix is discussed. It is there stated that Professor Bégouin could find only a single reference to the existence of threadworms in an excised appendix. It may therefore be worth noting that in a case of recurrent appendicitis occurring in a young woman I found at the operation that the appendix was crammed with threadworms, in a lively condition. The appendix itself was thickened but not ulcerated. Probably many similar cases have occurred without being recorded, but in a large number of such operations I have only met with threadworms in this one case. Few things, however, have really escaped the observation of our ancestors, and Santorini nearly 200 years ago (in 1724) in his careful description of the appendix noted that it was often the resort of intestinal worms and suggested that its function might be to form a safe retreat for them to breed in. This theory may not perhaps be generally accepted but no more ingenious one exists. It is of interest to note that the vermiform appendix was first described in 1524 by Carpi, that Columbus was interested in it, and that American surgeons have since been prominent in demonstrating its importance. By a curious coincidence appendicitis was definitely described for the first time in 1824, exactly 300 years after the anatomical recognition.

I am, Sirs, yours faithfully,

J. HUTCHINSON, Jun.

Cavendish-square, W., Sept. 15th, 1902.

THE ELECTION OF A DIRECT REPRESENTATIVE TO THE GENERAL MEDICAL COUNCIL.

To the Editors of THE LANCET.

SIRS,—The fact that Mr. Joseph Smith has placed the medical profession of England and Wales to the great and totally unnecessary expense of a contested election for the office of Direct Representative raises a question which the personalities and professional positions of Mr. Joseph Smith and Mr. George Brown would otherwise have rendered quite superfluous and immaterial to the profession at large.

The apology advanced by these gentlemen for Mr. Smith's obtrusion on public notice is that he is supported in his action by the Medical Practitioners' Association. Is this assertion correct?—in other words, have the members of that association been consulted on the matter and authorised this statement on their behalf? I am led to question this because there seems reason to believe that the members of this association are not even informed of matters which really are of direct personal interest and of the first importance to themselves.

If the members of this association are kept in ignorance of important facts it becomes all the more essential for a definite statement to be made as to the manner in which they have been consulted and have given Mr. Joseph Smith their authority to represent their views at this particular juncture.

I am, Sirs, yours faithfully,

F.R.C.S.

Sept. 15th, 1902.

THE PROPORTION OF THE MARRIAGE-TO THE BIRTH-RATE IN DIFFERENT CLASSES OF THE POPULATION IN ENGLAND.

To the Editors of THE LANCET.

SIRS,—I quote an extract from the statistics of the County of London issued last week by the London County Council:—

There has been a decided improvement in recent years in the marriage rate for London. In 1894 it reached its lowest point—17 per 1000. In 1899 it was 18·4 per 1000. The birth-rate does not show a

corresponding increase. *It is now at the lowest point it has ever touched.* Thirty years ago it was 35·4 per 1000; in 1899 it had sunk to 29·3. In this matter the state of affairs in London corresponds in a surprising degree to the whole country, where the fall has been on parallel lines. The two poorest districts, St. Luke's and Bethnal Green, are proportionately the most prolific. There are over four times as many births proportionately in St. Luke's as in St. George's, Hanover-square.

With regard to these facts it would be interesting to know whether the experiences of other practitioners in other parts of the country are similar to mine. In the part of Devonshire where I have been in practice for many years it is quite the exception for any of the young married couples of the upper middle class to have any family at all. Of notes that I have kept of marriages amongst private people of easy circumstances known to me, out of 47 marriages which have taken place between 1887 and 1900 31 have had no family at all—indeed, some of these have stated to their friends that they intend never having any—nine have either one or two children, and the remaining seven couples have families of from three to five children. The same state of limited production prevails amongst tradespeople, though not to so marked an extent. As regards the labouring classes the birth-rate appears to remain what it usually has been. With regard to the scarcity of children amongst the educated classes I have a well-grounded suspicion as to the cause. As to the effect, if this state of things exists all over the kingdom it cannot but be serious.

I am, Sirs, yours faithfully,

Sept. 15th, 1902. A GENERAL PRACTITIONER.

NOTES FROM INDIA.

(FROM OUR SPECIAL CORRESPONDENT.)

The Increasing Plague Mortality.—The Monsoon and the Famine.—A Hospital Train for India.—The Health Department in Calcutta.

THE mortality from plague throughout India has increased during the past week from 3762 to 4371—chiefly due to the recrudescence developing in the Bombay Presidency. The detailed figures are—Bombay Presidency, 3111 deaths, as against 2642; Bombay City, 35, as against 22; Karachi City, 11, as against five; Madras Presidency, 163, as against 145; Calcutta City, 10, as against nine; Bengal Presidency, five, as against 10; United Provinces, 195, as against 153; Punjab, 63, as against 106; Mysore, 614 as against 612; Hyderabad State, 143, as against 23; and Berar, 21, as against 34. It will be noticed that the increase is for the most part general few areas showing any decline. The disease is reported to be spreading in the Poona districts. The mortality is greater than at the corresponding week last year and that was higher than for the previous year. It is therefore impossible to shut one's eyes to the fact that the outlook is very threatening and as so many more districts and provinces have become infected the recrudescence may probably culminate with a mortality larger than India has yet suffered. A case of plague has been imported into Simla and has ended fatally. 70 contacts were removed at once to the segregation camp. Few people at home realise the enormous preparations which are being made for the great Delhi durbar and coronation festivities in January and the immense concourse of people which they will bring to that district. It is necessary to sound a note of warning that the anticipated plague outbreak may occur on or before this time and that if the infection spreads into the immediate vicinity of these places panic if nothing else may mar this great occasion.

Although the monsoon has to a certain extent been re-established over Western India and rain has fallen in Gujerat and other famine areas it is as yet too soon to have had any effect upon the numbers under relief. In fact, during the week ending August 22nd the number of persons under relief rose by 67,000 and the total is now over half a million, of which 371,899 are in British territory and 130,105 in native states.

The Government has decided to have special carriages to form a hospital train for annual use in conveying invalids from up-country stations to the sea and in time of war for carrying the sick and wounded from the base of operations to stations in India or to ports of embarkation. This train will be constructed on the principle of the Princess Christian hospital train used in the South African War. The carriages will be the property of the military department, but will be maintained and kept in order by the railways concerned.

Several changes have been effected in the health department in Calcutta by the acting health officer, Dr. T. F. Pearse. They concern "an improvement in the registration of the cases of death by an inquiry upon the death of every person dying in Calcutta," the appointment of special food inspectors for each district, the appointment of an extra inspector of meat shops for the better inspection of these places and for the discovery of illicit slaughtering, the wholesale disinfection of tanks around which cholera has broken out, the compulsory registration of all burial grounds (of which I understand there are over 100), the issue of forms of notification for certain infectious diseases, the establishment of Hindu slaughter-houses in each district, and the reorganisation of the clerical work in all the district offices.

August 30th.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

Annual Inspection of the Corporation Hospitals.

THE members of the Port Sanitary and Hospitals Committee of the City Council made their annual inspection of the various infectious hospitals on Sept. 9th. The tour proved both interesting and instructive. At Fazakerley a hospital of colossal proportions is now in course of erection. The large estate purchased by the corporation some years ago is already partly built upon, there being several wards for scarlet fever, typhoid fever, and other cases, now in use. When the buildings are completed there will be provided two separate establishments, one of which will be specially set apart for the treatment of cases of small-pox. The visitors were generally struck with the scrupulous cleanliness, the brightness, and the perfection of the arrangements in all the hospitals. At Fazakerley and Parkhill open spaces abound in which convalescent children can romp about. The hospitals visited by the committee were those situated in Netherfield-road, Fazakerley, Mill-lane, Parkhill, and Grafton-street. At the Mill-lane hospital, the original accommodation in which had been increased by 88 beds in four wards, interesting ceremonies took place. The Lord Mayor was invited formally to declare the new extension open and for that purpose was presented with a gold key subscribed for by the members of the committee. Dr. Thomas Clarke, the chairman of the hospital committee, was also presented with a similar gold key upon declaring the new pavilion open. The past year has been one of marked progress for the city hospitals. Seven years ago there were 400 beds under corporation control; there are now 950 beds. Last year 3337 cases of infectious disease were dealt with, and up to August 1st of this year 2900 cases had been treated. Less than a decade ago Liverpool was pointed to as a city hopelessly behind in the way of hospital accommodation for infectious diseases. To-day the city is better provided than any other town in England; and it is gratifying and reassuring to know that the city council, under the able guidance of Dr. E. W. Hope, the medical officer of health, is acting in this matter with a liberality and enlightenment worthy of grateful recognition by the citizens of Liverpool.

The late Professor Virchow of Berlin.

In view of the recent demise of Professor Virchow it may be interesting to recall the fact of his visit to Liverpool on Sept. 28th, 1898, on the occasion of the opening of the Thompson-Yates Laboratories at University College by Lord Lister, an honour highly appreciated by the Liverpool school.

The Ninth Expedition of the Liverpool School of Tropical Medicine.

Major Ronald Ross, C.B., F.R.S., late I.M.S., the Walter Myers lecturer on Tropical Medicine, left London for Brindisi on Sept. 12th, to inaugurate preventive measures at Ismailia on the Suez Canal against malaria. Major Ross will take charge of the operations by special request of the Suez Canal authorities. Sir William MacGregor, K.C.M.G., the governor of Lagos, who has shown a lively interest in the operations of the Liverpool School of Tropical Medicine, and who has himself done such important work in the same direction at Lagos, has expressed a desire to witness Major Ross's operations at Ismailia and will join him at Brindisi. They will proceed to Ismailia, where the Suez Canal Company has made arrangements to give them a suitable welcome.

Enlargement of the Liverpool Hospital for Consumption.

The recommendation of the estate committee of the City Council that the reversion of the premises, 70, Mountpleasant, should be sold to the trustees of the Consumption Hospital for the sum of £400, subject to the consent of the Local Government Board and also subject to the condition that the existing premises shall be demolished and new hospital buildings erected within five years from the date of such consent, in accordance with plans and elevations to be approved by the corporation, was approved.

Handsome Donation to the David Lewis Northern Hospital.

Sir William Henry Tate, Bart., has given the sum of £1000 to the David Lewis Northern Hospital for the purpose of endowing a bed to be named after his father, the late Sir Henry Tate, Bart. This generous gift is a most welcome addition to the endowment fund of the hospital.

Infectious Hospital Accommodation at Prescot.

The proposal to provide a new infectious hospital to accommodate children occupied the attention of the Prescot board of guardians at their last meeting. The present buildings are altogether inadequate. The new hospital would cost about £5000. The matter was postponed for a fortnight in order that a complete scheme might be submitted.

The Maghull Home for Epileptics.

Sir Alfred L. Jones, K.C.M.G., has generously contributed the sum of £1000 towards the farm and extension fund of the home for epileptics at Maghull. This amount was promised last year, conditionally on the committee raising a further sum of £9000, to enable them to purchase land for employing male patients and to carry out necessary extensions to meet the increasing demand for accommodation. A few days ago the committee were able to intimate to Sir Alfred Jones that this condition had been fulfilled. They also desire to acknowledge the liberality of the friends who have enabled them to achieve this happy result.

Opening of Morecambe Cottage Hospital.

In beautiful weather the Morecambe Queen Victoria Cottage Hospital, which has been erected at a cost of £3000, was opened on Sept. 9th by the Earl of Lathom. His lordship, as Provincial Grand Master of the Freemasons of the Province of West Lancashire, was entertained at luncheon by the brethren of the Morecambe Lodge, and the formal proceedings followed. Mr. Thomas Baxter, the chairman of the committee, presided, and later in the day handed over a full equipment for the operating-theatre of the hospital. Lord Lathom opened the building with a suitably engraved gold key which was presented to him. The institution was started free of debt; a considerable sum, however, will be required annually to meet the working expenses of the charity.

Sept. 16th.

WALES AND WESTERN COUNTIES NOTES.

(FROM OUR OWN CORRESPONDENTS.)

Sanitation in North Wales.

THE Honourable Society of Cymmrodorion was founded under royal patronage in 1751 and it has for its object the bringing together of Welshmen, especially those resident out of Wales, with a view to advancing the welfare of their country. Its especial aims are the improvement of education and the promotion of intellectual culture by the encouragement of literature, science, and art, as connected with Wales. Of late years there have been meetings of the society in Wales in connexion with the National Eisteddfod and at the Bangor meeting, held on Sept. 8th, a discussion took place upon National Health and Sanitation. Introductory papers were read by Dr. Richard Jones, medical officer of health of Festiniog and of the county of Merioneth; by Mr. D. L. Thomas, medical officer of health of the metropolitan borough of Stepney; and by Dr. Peter Fraser, medical officer of health of the Carnarvonshire combined district. Dr. Jones urged the establishment of a public health department in connexion with the constituent colleges of the University of Wales at Aberystwith and Bangor upon the lines of that already organised at the Cardiff College. He advocated, also, the teaching of hygiene in the evening continuation schools and the founding of an eisteddfod health lectureship or exhibition from the surplus funds of the Eisteddfod. Mr. Thomas considered that sanitation was a national question and should be administered in all its aspects, not from, or by, a small parochial body, for districts that neglected to carry out their duties efficiently were a menace to the national health. Dr. Fraser brought forward carefully compiled statistics comparing the birth-rates and death-rates of Wales and of North Wales with those of the whole of England and Wales and with other countries. The period covered by these figures includes the last 30 years of the nineteenth century. Although during these three decades there has been in the whole country a general fall in the birth-rate, in South Wales the rate has always been above, and in North Wales it has always been below, that of England and Wales. With regard to the deaths from all causes it appears that while there has been a considerable lowering of the death-rate during the period named in England and Wales, yet during the last decade of the century the death-rate in South Wales was the same, and in North Wales it was actually higher, than that of the preceding 10 years. The number of deaths in North Wales from the so-called principal zymotic diseases compares favourably with that recorded in South Wales and in England and Wales, but with respect to the deaths from cancer, tuberculosis, and diseases of the circulatory system North Wales occupies a discouraging position. During the last 10 years of the century the cancer death-rate in England and Wales was 760 per 1,000,000 of the population, but in North Wales the rate was 1009 per 1,000,000. Both in North Wales and in the whole country the death-rate from all forms of tuberculosis has fallen during the past half-century but in the 10 years 1891-1900 the North Wales death-rate was 2244 per 1,000,000, while that of England and Wales was 2005 per 1,000,000. During the last 20 years of the century there was a considerable increase in the number of deaths from diseases of the circulatory system in North Wales, where during the last decade the death-rate from this cause was 2145 per 1,000,000, compared with 1655 per 1,000,000 in England and Wales. The principal cause of the high death-rate from tuberculosis in North Wales, in Dr. Fraser's opinion, is due to a great extent to the small, badly-ventilated, damp, and often badly-lighted bedrooms of many of the older cottages and the remedy obviously lies in building new, and altering the old, houses.

Women Sanitary Inspectors.

The Newport corporation has decided, on the recommendation of the medical officer of health (Dr. J. Howard-Jones), to appoint a female sanitary inspector.—The Worcestershire County Council are about to appoint a female health missioner for the urban district of Oldbury. The county council will pay £50 and the district council £40 of the salary of the missioner.

Bristol General Hospital.

The half-yearly meeting of the governors of this institution was held on Sept. 8th, under the presidency of Mr. Proctor Baker. It was reported that the donations for the past six months amounted to £4233, including £1500 from Lady Smyth for the endowment of a bed in memory of her late husband. The chairman stated that the new out-patients department had been completed and was very satisfactory, and the new post-mortem room was also finished. He added that the committee had undertaken to organise a hospital to meet the demands of Avonmouth in connexion with the new docks, Sir John Aird and Co., the contractors, having agreed to defray all the expenses incurred.

Sept. 15th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Destruction of Diseased Meat in Dublin.

A NEW refrigerator, capable of making six tons of ice per day or producing an equivalent refrigerating effect, was formally opened by the Lord Mayor in connexion with the city abattoir on Sept. 15th. Town Councillor Clancy took the opportunity to call attention to the necessity of providing an apparatus within the abattoir for the destruction of offal and more especially of diseased meat. A deputation, he stated, from the corporation visited many continental cities some years ago and its report recommended the adoption of the Podewil system by which diseased meat and offal are

converted into a dry powder which has a ready market as a fertiliser and as a food for swine, fowls, &c. In Dublin as many as 108.112 pounds were destroyed in 1891, and 50,512 pounds in 1892 up to August 31st. This meat was in part surrendered and in part seized while coming into the city. According to the present arrangement it is the custom to remove all condemned carcases from the abattoir through the public streets to the only place—a private establishment—where it can be destroyed. Mr. Clancy said that it was the duty of the civic authorities to erect such a form or destructor within the premises of the abattoir as would put the method of the disposal of diseased meat beyond doubt of question. He stated that Sir Charles Cameron, the superintendent medical officer of health, was in favour of some action being taken in the matter.

Cork-street Fever Hospital and House of Recovery.

At the last meeting of the managing committee of the Cork-street Fever Hospital the registrar reported that during the month of August the admissions were very numerous owing to the prevalence of scarlet fever, diphtheria, measles, and enteric fever. Several cases of typhus fever were also admitted. All traces of small-pox having disappeared from Dublin the convalescent home at Beneavin has been restored to its original use and is now filled with convalescents from scarlet fever, &c. It will be remembered that in connexion with the last annual report of the board of superintendence of the Dublin hospitals it was notified that owing to the need of more suitable accommodation for the nursing staff the governors had purchased a site opposite the hospital gates on which they propose to build a house to accommodate 50 nurses. The new building is to be called "the James Weir Home for Nurses in connexion with Cork-street Hospital."

Sept. 16th.

NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

Infant Mortality in New York City.

DESPITE the low temperature in New York City this summer the increase in infant mortality has been marked. The Board of Health has consequently been making a careful study of the recent vital statistics of the city. The following figures show the deaths in Manhattan Borough in June of children under two years of age from diarrhœal diseases, with the humidity and temperature for each day. On June 3rd, the hottest day of the month, with a mean temperature of 78·6° F. and 72 per cent. of humidity, there were only three deaths in this class. On June 29th, one of the coolest days, with a mean temperature of 60·6°, there were 12 deaths, and this day concluded a period of 12 consecutive days during which the mean average temperature was 65·5°. On August 2nd, one of the hottest days of the month, there were 18 deaths in this class; while on the 3rd, one of the month's coolest days, there were 11. The two days of the heaviest infant mortality were relatively cool days with humidity of about the average. These figures warrant no generalisation whatever.

The American People Longer Lived than a Century Ago.

The Census Bureau has recently published a report by which it is shown that the span of human life in the United States is steadily increasing. The census statistics are taken by decades to compute the median age—that is such an age that half the population is under it and the other half over it. The median age of the inhabitants of the United States in 1900 was 22·8 as compared with 21·9 10 years previously. The increase in the median age of the white population since 1810 is 7·4 years. The Census Bureau chiefly attributes this gain in longevity to the remarkable progress effected in medical and sanitary science.

Accident to the President.

On Wednesday, Sept. 3rd, President Roosevelt met with an accident which but for his good fortune might have resulted seriously. The carriage in which the President was driving from Pittsfield to Lenox was run down by a trolley-car near the Lenox Club. All the occupants of the carriage were thrown out, and William Craig, the secret service man in attendance on the President, who was on the box with the driver, was hurled from the seat, run over by the car, and killed on the spot. The coachman was also thrown to the ground, sustaining a fracture of the skull from which he died soon afterwards. The President himself escaped with a slight cut and bruise on the right cheek, his secretary, Mr. George B. Cortelyou, was severely cut about the face and the back of the head, while of the others in the carriage Governor W. Murray Crane was slightly bruised. The accident is said to have been caused by the driver of the President's carriage attempting to cross the trolley lines diagonally, without noticing a trolley car which was coming up at a high rate of speed from behind. The President's carriage was completely wrecked, and Surgeon Lung, who helped to care for the wounded, expressed his wonder that everyone in the carriage was not killed. At the time of the accident President Roosevelt was on a political tour of the New England States, and he decided to fulfil his programme, which was nearly ended. The news of the accident naturally produced consternation throughout the country, the more so, perhaps, as but such a short time has elapsed since the assassination of President McKinley.

The Increase of Jews in New York.

A decade ago there were 130,000 Jews in the whole of America, now there are 1,058,000—that is to say, nearly eight times more Jews are now in the country than there were 10 years ago. The increase, however, in New York city has been most surprising. A writer in a recent number of the *Jewish World* makes an elaborate estimate of the number of Jews in New York City based upon the statistics of Jewish marriages and deaths—principally the latter—during the past year, and he comes to the conclusion that the number of Jews in New York City is now close upon 600,000. These figures are probably not quite accurate, as they are founded upon the assumption that the Jewish death-rate is but five-sixths as great as that of the total population of the city; nevertheless there can be little doubt that the Jewish inhabitants of greater New York are at least 500,000, nearly all of whom are in the borough of Manhattan—in fact, in New York City proper nearly one person in four is a Jew.

The So-called "Spotted Fever" of the Rocky Mountains.

According to the United States Public Health Reports, August 15th, Surgeon J. O. Cobb of the United States Public Health and Marine Hospital Service, who was directed on June 23rd to proceed to Missoula, Montana, in order to investigate an outbreak of the so-called "spotted fever" prevailing in that district, has recently handed in his report. This report is too lengthy to transcribe in full, but the following are the salient points. For 17 years the disease has been known among the local practitioners of the Bitter Root Valley; it has always been limited to the spring months, no case having been reported later than July 20th and none earlier than one case of uncertain date in January. Usually the first cases appear in March. All clinical experience goes to show that the disease is not contagious or infectious. It is, however, without doubt an inoculable disease, as an intra-corpuscular parasite has been found to be constantly present in the blood of each patient examined this year. The organism resembles very closely Theobald Smith's Texas cattle fever organism, and it is certainly reasonable to believe, from the knowledge at hand, that this disease is introduced into man in the same way and in like manner as in the Texas cattle fever organism—viz., by the tick. The investigations undertaken go to show that the disease is confined to the Bitter Root and Lolo valleys, covering an area of about 20 miles in width and 40 in length. Having found the intra-corpuscular organism the next step was to find the host. After some trouble it was discovered that the host was not the tick, but some animal infested by ticks. Finally the conclusion was reached that the animal in question was the "gopher," or ground squirrel, which is numerous in that very region in which the disease prevails. Clinically the disease is curious. Persons affected have a bluish spotting of the skin, the conjunctivæ are markedly infected, the tongue is moist but slightly coated, and the face and extremities are puffy and bloated but the skin does not pit on pressure. The disease is extremely deadly; so far all cases this year have died, while only two bad cases with well-marked eruptive lesions have been known to recover.

Sept. 10th.

VACCINATION GRANT.—Mr. Bertram Thomas Read, M.R.C.S. Eng., L.R.C.P. Lond., medical officer of the Odiham District of the Hartley Wintney Union, has been awarded a grant for successful vaccination.

Medical News.

LITERARY INTELLIGENCE.—Messrs. J. & A. Churchill announce the following new books and new editions for publication this autumn. "A Manual of Hygiene," by Dr. Hamer of St. Bartholomew's Hospital; "Pathological Anatomy and Histology," by Dr. Lazarus-Barlow of the Westminster Hospital; "A Handbook of Clinical Medicine," by Dr. T. D. Savill; "Cancer of the Stomach," by Dr. Fenwick and Dr. W. Soltau Fenwick; "Obstinate Hiccough," by Dr. Knuthsen; "The Chemistry of the Terpenes," by Dr. Heusleur, translated by Dr. Pond; "Electric Lighting," edited by Mr. W. J. Dibdin, being the fourth volume of Groves's and Thorpe's "Chemical Technology." New editions will also be published of "Morris's Treatise on Anatomy," with more than 200 new or altered illustrations; of "Starling's Elements of Human Physiology"; of "Heath's Practical Anatomy," revised by Mr. J. Ernest Lane; of Coles's work on "The Blood"; of Haig's "Diet and Food"; and of Bloxam's "Chemistry, Inorganic and Organic."—Messrs. Baillière, Tindall, and Cox announce for publication during the current month the fifth edition of Messrs. Rose and Carless's "Manual of Surgery"; the fourth edition of Professor Politzer's text-book of "Diseases of the Ear" (authorised English translation under the author's supervision); the fourth edition of Messrs. Cross and Cole's "Modern Microscopy"; the fourth edition of Dr. Murrell's "Forensic Medicine and Toxicology"; the fourth edition of Dr. Gubb's "Aids to Gynæcology"; the third edition of Dr. Macnaughton-Jones's "Practical Points in Gynæcology"; and revised editions of "Aids to Sanitary Science" (by Dr. Allen and Dr. Farrar), of Fleming's "Text-book of Veterinary Surgery" (revised by Professor Macqueen) and of "The Veterinary Pharmacopœia" by Dr. G. Gresswell. Also the following new works: "Errors of Refraction," by Mr. Ernest Clarke, F.R.C.S.; a monograph on "Pulmonary Consumption," by Dr. Arthur Latham (winner of the King's prize of £500); a monograph on "Anæsthetics," by Dr. Blumfeld; "Essays on Operative Surgery," by the late Sir Wm. Stokes; and "The Theory and Practice of Infant Feeding," by Dr. Chaplin.—The following are amongst the new works and new editions announced by Mr. H. K. Lewis:—Cancer of the Uterus: a Clinical Monograph on its Diagnosis and Treatment, by A. H. N. Lewers.—Handbook of the Pathology of the Skin, being an introduction to the Histology, Pathology, and Bacteriology of the Skin, with special reference to Technique, by J. M. H. MacLeod, Assistant in the Bacteriological Department, Charing Cross Hospital.—A new (third) edition of Diseases of the Skin: their Description, Pathology, Diagnosis, and Treatment, by H. Radcliffe-Crocker; the second edition of Hygiene and Public Health, by L. C. Parkes and H. R. Kenwood; and a new edition of Ophthalmic Practice, by Charles Higgens, revised with the assistance of A. W. Ormond, ophthalmic clinical assistant, Guy's Hospital.

PRESTON AND COUNTY OF LANCASTER QUEEN VICTORIA ROYAL INFIRMARY.—During the whole of the first week of September the city of Preston in Lancashire was given up to elaborate pageants, ceremonial observances, social festivities, and other manifestations of public rejoicing, the occasion being the celebration of "Preston Guild Merchant." Of all the Guilds Merchant that were held in mediæval times—and there were over 100 in England—that of Preston is the only one which now receives public recognition. In early times the object of the organisation of the Gilda Mercatoria or Guild Merchant was the maintenance of the franchises and other privileges of the freemen, privileges which made it almost impossible for others than citizens to engage in trade. The first Guild Merchant of which there is any record was held in 1328. From 1542 down to the present date the Guilds have been regularly held every 20 years. In 1662 the Guild and its concomitant festivities lasted for six weeks. On the present occasion the first event of the Guild was the procession with which the Guild Mayor (the Earl of Derby) went from the Guild Hall to attend Divine service in the parish church on Sunday, August 31st, the sermon being preached by the Bishop of Truro. On Sept. 1st a Guild Court was held in the Guild Hall, after which the the Guild Mayor again made a state visit to the parish church and then returned to the Guild Hall where lengthy Latin orations were delivered by the head master of the grammar school, the head boy of the grammar school, and the Recorder. One of the events of Sept. 2nd was a visit of the Earl and Countess of Derby to the Preston and County of Lancaster Queen Victoria Royal Infirmary, where the countess opened the Diamond Jubilee Wing (Nurses' Home) and the Robert Charles Brown operating theatre. The proceedings commenced with the offering of prayer by the Bishop of Burnley, after which Mr. W. P. Park, chairman of the board of management, said that it was through Lord Derby that the Royal assent was given to the alteration of the name of the hospital, the motive of which was the fact that the building about to be declared open had been erected in commemoration of the late Queen's Diamond Jubilee. The architect then handed to the countess a gold key with which she performed the opening ceremony. The company then proceeded from the Diamond Jubilee Wing to the operating theatre, the door of which the countess unlocked. At this point Dr. Robert Charles Brown of Preston gave a short description of the operating theatre and Lord Derby then thanked him on behalf of the community for providing it, constructed and furnished as it was in every way according to the requirements of modern science. Dr. Brown, in reply, said that he had been connected for nearly 50 years with the infirmary and its predecessor the old Preston Dispensary. There was no object more worthy of assistance than a hospital or infirmary, and it was in this belief that he had made his various contributions to the Preston Infirmary. A properly constructed and suitably furnished operating theatre was essential for surgical work. As regards the organ, he had personally experienced the delights of listening to a chamber organ during an illness and he had resolved that whenever the opportunity presented itself he would place one in the Preston Infirmary for the benefit of patients and officials alike. The party then went to another portion of the premises where Lord Derby laid the foundation stone of the out-patients' department which occupied a detached position as it was thought desirable for several reasons to exclude the out-patients from the main building of the hospital. After the ceremony Dr. Robert Trimble moved, and Dr. G. C. Kingsbury seconded, a vote of thanks to Lord Derby, who made a brief reply and the proceedings then terminated.

BOOKS, ETC., RECEIVED.

BOERICKE AND RUNYON CO., New York.

Electricity in Medicine and Surgery, including the X Ray. By William Harvey King, M.D., for 12 years Editor of the *Journal of Electro-Therapeutics*, Professor of Electro-therapeutics in the New York Homœopathic Medical College and Hospital. In Two Parts. Second edition. With a Section on Electro-physiology by W. Y. Cowl, M.D., Berlin, and a Section on the Bottini Operation by Albert Freudenberg, M.D., Berlin. Price not stated.

CHURCHILL, J. & A., 7, Great Marlborough-street, W.

Heath's Practical Anatomy: A Manual of Dissections. Ninth edition. Edited by J. Ernest Lane, F.R.C.S., Surgeon and Lecturer on Anatomy at St. Mary's Hospital; Examiner in Anatomy for the Fellowship of the Royal College of Surgeons. Price 12s. 6d.

Diet and Food, Considered in Relation to Strength and Power of Endurance, Training, and Athletics. By Alexander Haig, M.A., M.D. Oxon., F.R.C.P., Physician to the Metropolitan Hospital and the Royal Hospital for Children and Women. Fourth edition. Price 2s.

Manual of Hygiene. By W. H. Hamer, M.A., M.D., D.P.H. Cantab., B.Sc. Lond., F.R.C.P., Lecturer on Public Health, St. Bartholomew's Hospital, Assistant Medical Officer of Health of the Administrative County of London. Price 12s. 6d. net.

Elements of Human Physiology. By Ernest H. Starling, M.D. Lond., F.R.C.P., F.R.S., Jodrell Professor of Physiology, University College, London. Fifth edition. Price 12s. 6d.

The Blood; how to Examine and Diagnose its Diseases. By Alfred C. Coles, M.D., B.Sc. of Public Health, Edinburgh; formerly Senior House Surgeon at the County Hospital, York. Second edition. Price 10s. 6d.

The Cause and Prevention of Decay in Teeth: An Investigation into the Causes of the Prevalence of Dental Caries; to which are appended some Suggestions on its Prevention. By J. Sim Wallace, M.D., D.Sc., L.D.S.R.C.S., Honorary Dental Surgeon, West End Hospital for Nervous Diseases. Second Edition. Price 5s.

CLARKSON AND GRIFFITHS, LIMITED, 160, Deansgate, Manchester.

An Introduction to the German Language. By Joseph Dulberg, M.D., LL.D. Price 1s. net.

CURWEN, J., AND SONS, LIMITED, 24, Berners-street, W.

The Art of Breathing as the Basis of Tone-production. By Leo Kofler, Organist and Choirmaster of St Paul's Chapel, Trinity Parish, and Teacher of the Art of Singing, New York City. Fifth American and First English edition. Price 4s.

DRUCK- UND VERLAGS ACTIEN-GESELLSCHAFT VORM. DOELTER, Emmendingen.

Das Sanatorium Wehrawald. Vortrag gehalten am 11. Dezember, 1901, in der Naturforschenden Gesellschaft zu Freiburg i. B. Von Dr. med. G. Treupel, a. o. Professor für innere Medizin an der Universität Freiburg i. B. Price not stated.

FISCHER, GUSTAV, Jena.

Klinisches Jahrbuch. Im Auftrage des Königlich Preussischen Herrn Ministers der geistlichen, Unterrichts- und Medicinal-Angelegenheiten. Unter Mitwirkung der Herren Prof. Dr. M. Kirchner und Dr. Naumann. Neunter Band. Zweites Heft. Prof. Dr. A. Gärtner: Die Quellen in ihren Beziehungen zum Grundwasser und zum Typhus. Price M. 10.

Jahresbericht über die Fortschritte und Leistungen auf dem Gebiete der Sozialen Hygiene und Demographie. Band I.: Bericht über die Jahre 1900 und 1901. Herausgegeben von A. Grotjahn, Dr. med., und F. Kriegel, Dr. phil. Price M. 7.50.

KARGER, S., Karlstrasse, 15, Berlin.

Jahrbuch für Kinderheilkunde und Physische Erziehung. Unter Redaction von O. Heubner, A. Steffen, Th. Escherich. 56, der dritten Folge 6. Band. 5. Heft. Ausgegeben am 1. September, 1902. Preis des Jahrgangs (zwei Bände) M. 36.

KIMPTON, HENRY, 13, Furnival-street, Holborn, E.C.

Practical Dietetics. With Special Reference to Diet in Disease. By W. Gilman Thompson, M.D., Professor of Medicine in the Cornell University Medical College in New York City. Second edition, enlarged and thoroughly revised. Price 21s. net.

The Practice of Obstetrics. By American Authors. Edited by Charles Jewett, M.D., Professor of Obstetrics and Gynecology in the Long Island College Hospital, New York. Second edition, revised and enlarged. Price 25s. net.

The Science and Art of Prescribing. By E. H. Colbeck, B.A., M.D. Cantab., M.R.C.P. Lond., D.P.H. Cantab., and Arnold Chaplin, B.A., M.D. Cantab., M.R.C.P. Lond., Physicians to Outpatients at the City of London Hospital for Diseases of the Chest, Victoria-park, E. Price 5s. net.

MACMILLAN AND CO., London and New York.

Wolfe. ("English Men of Action" Series.) By A. G. Bradley. Price 2s. 6d.

METHUEN & CO., 36, Essex-street, W.C.

A Junior Chemistry. By E. A. Tyler, B.A., Lat. Science Scholar of St. John's College, Cambridge; Fellow of the Chemical Society; Science Master at Framlingham College. Price 2s. 6d.

NEW SYDENHAM SOCIETY (Agent: H. K. Lewis, 136, Gower-street W.C.).

An Atlas of Illustrations of Clinical Medicine, Surgery, and Pathology. Compiled for the New Sydenham Society. (A Continuation of the "Atlas of Pathology.") Fasciculus XIV. (Double Number). Fasciculi I. and II. of New Series. Frambœsial Syphilis (Yaws and Parangi). With Descriptions by Jonathan Hutchinson, F.R.C.S., F.R.S., LL.D., and Sir William Kynsey, C.M.G., F.R.C.P.I. Plates A to H and LXXV.—XCI. Price to Non-members £1 1s.

REHMAN, LIMITED, 129, Shaftesbury-avenue, W.C.

Abdominal Examination and Manipulation in Pregnancy. By Alexander Maclennan, M.B., C.M. Glasg., L.M. (Rotunda, Dublin), Clinical Assistant to the Professor of Obstetrics and Gynæcology, University of Glasgow. With an Introduction by Professor Murdoch Cameron. Price 6s. net.

SAUNDERS, W. B., AND COMPANY, Philadelphia and London.

Atlas and Epitome of Abdominal Hernias. By Dr. Georg Sultan, First Assistant in the Surgical Clinic in Göttingen, Prussia. Authorised translation from the German. Edited by William B. Coley, M.D., Clinical Lecturer on Surgery, Columbia University (College of Physicians and Surgeons). Price 13s. net.

Treatise on Diseases of the Skin. For the Use of Advanced Students and Practitioners. By Henry W. Stelwagon, M.D., Ph.D., Clinical Professor of Dermatology in the Jefferson Medical College and Woman's Medical College, Philadelphia. Price 25s. net.

SHERRATT AND HUGHES, 27, St. Ann-street, Manchester.

The Pharmacological Action and Therapeutic Uses of the Nitrites and Allied Compounds. Including the Croonian Lectures for 1895. By the late Daniel John Leech, M.D. Lond., D.Sc. Vict., F.R.C.P., Senior Physician to the Manchester Royal Infirmary and Professor of Materia Medica and Therapeutics in the Owens College. Edited by R. B. Wild, M.D. Lond., M.Sc. Vict., M.R.C.P., Leech Professor of Materia Medica and Therapeutics in the Owens College. Price 10s. 6d. net.

SWAN SONNENSCHEIN AND CO., LIMITED, London. (E. P. DUTTON AND CO., New York.)

Avenues to Health. By Eustace H. Miles, M.A., formerly Scholar of King's College, Cambridge, Assistant Master at Rugby School, and Honours Coach and Lecturer at Cambridge University. Price 3s. 6d.

THACKER AND COMPANY, LIMITED, Bombay.

Legal Medicine (in India) and Toxicology. In Two Volumes. By Major Collis Barry, I.M.S., F.R.S.E., F.I.C., &c., Chemical Analyser to the Government of Bombay, Professor of Chemistry, Medical Jurisprudence, and Toxicology, Grant Medical College, Bombay. Vol. I. Price not stated.

VOGEL, F. C. W., Leipsic.

Archiv für Experimetelle Pathologie und Pharmakologie. Redigirt von Dr. B. Naunyn, Professor der Medicinischen Klinik in Strassburg I.E., und Dr. O. Schmiedeberg, Professor der Pharmakolgie in Strassburg I.E. 48. Band, 3. und 4. Heft. Preis pro Band, M. 16 (6 Heften).

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, for publication in the next number.*

ARMSTRONG, W. G., M.B., Ch.M. Syd., has been appointed Lecturer in Infectious Diseases, Disinfection, and Sanitary Law at the Sydney Technical College, New South Wales, Australia.

BARRETT, J. W., M.D. Melb., F.R.C.S. Eng., has been appointed a Member of the Medical Board of Victoria, Australia.

BAXTER, ALEXANDER KIDD, M.B., Ch.B. Edin., has been appointed House Surgeon to Tiverton Infirmary and Dispensary, Devonshire.

BODY, H. M., M.R.C.S., L.S.A., has been re-appointed Medical Officer of Health of Crediton (Devon).

HANKINS, J. T., M.R.C.S., L.S.A., has been appointed a Member of the Medical Board of New South Wales, Australia.

HARDCASTLE, COOPER, M.B., M.S. Edin., has been appointed Government Medical Officer and Vaccinator at Hillgrove, New South Wales, Australia.

HOLMES-MERRICK, F. R., M.D. Dubl., has been appointed Medical Officer of Health for the Rural District of Basingstoke.

JOHNSON, C. H., M.B., Ch.M. Edin., has been appointed Public Vaccinator for the North-Eastern District of Victoria, Australia.

MACKENZIE, JOHN HUGH, F.R.C.S. Edin., has been appointed Medical Officer of Health for the Shire of Bulla Victoria, Australia.

MARR, JOSEPH BELL, L.F.P.S.G., has been appointed Public Vaccinator for the South-Western District of Victoria, Australia.

MUIR, D. C., M.D. Glasg., has been re-appointed Medical Officer of Health to the Abertillery Urban District Council.

NESBITT, R., L.R.C.P. & L.M. Irel., has been re-appointed Medical Officer of Health for the Sutton in Ashfield Urban District Council.

RABY, L., M.D. Durh., has been appointed Medical Officer for the Second District of the Devizes (Wilts) Union.

ROBSON, HENRY NAUNTON, L.R.C.P. Lond., M.R.C.S., has been appointed House Surgeon at the General Hospital, Stroud, Gloucestershire.

SANDILAND, DIGBY S., M.R.C.S., L.R.C.P. Lond., has been appointed Senior House Surgeon to the West Ham and East London Hospital, E.

SCOTT, JAMES ANDREW NEPTUNE, M.D. Glasg., has been appointed Public Vaccinator for the North-Western District of Victoria, Australia.

SCOTT, JOHN DANIEL KING, M.B., Ch.B. Melb., has been appointed Public Vaccinator for the South-Western District of Victoria, Australia.

SHANASY, THOMAS, L.R.C.P., L.R.C.S. Edin., has been appointed Public Vaccinator for the North-Western District of Victoria, Australia.

THWAITES, JOHNSTONE SIMON, M.B. Melb., has been appointed Officer of Health for the Shire of Mansfield, Victoria, Australia.

TIGHE, J. M., L.R.C.P. and L.R.C.S. Edin., has been appointed Officer of Health, *pro tem.*, for the City of Hawthorne, Victoria, Australia.

WEST, FRANCIS WILLIAM, M.B. Syd., has been appointed Government Medical Officer and Vaccinator at Camden, New South Wales, Australia.

WILLIAMS, JOHN, M.D. Edin., M.R.C.S. Eng., has been appointed a Member of the Council of the University of Melbourne, Victoria, Australia.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BELFAST UNION WORKHOUSE INFIRMARY.—Resident Surgeon. Salary £80 per annum, with rations and apartments.

BIRKENHEAD BOROUGH HOSPITAL.—Junior Male House Surgeon. Salary £80 per annum, with board and washing.

BLACKBURN AND EAST LANCASHIRE INFIRMARY.—Junior House Surgeon. Salary £70 per annum, with board, washing, &c.

BRADFORD POOR-LAW UNION HOSPITAL AND WORKHOUSE.—Resident Assistant Medical Officer, unmarried. Salary £125, with rations, apartments, and washing.

CANCER HOSPITAL, London.—Pathologist. Salary £250 per annum.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Gray's Inn-road, W.C.—House Surgeon.

CHELTENHAM GENERAL HOSPITAL.—Junior House Surgeon, unmarried. Salary £70 per annum, with board, lodging, and washing.

CHESTER COUNTY ASYLUM.—Third Assistant Medical Officer, unmarried. Salary £160 per annum, with board, lodging, and washing.

CORNWALL COUNTY ASYLUM, Bodmin.—Junior Assistant Medical Officer, unmarried. Salary £130, rising to £160, with board, apartments, laundry, &c.

EAST SUSSEX NEW LUNATIC ASYLUM.—Medical Superintendent. Salary £900 a year, with unfurnished house, &c.

EASTERN DISPENSARY, Leman-street, Whitechapel, E.—Physician. Honorarium £50 per annum.

GLASGOW EYE INFIRMARY.—Resident Assistant House Surgeon. Salary £75, with apartments and board.

GLOUCESTER GENERAL INFIRMARY AND GLOUCESTERSHIRE EYE INSTITUTION.—House Surgeoney. Salary £100 per annum, with board, lodging, and washing.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Assistant Resident Medical Officer for six months. Salary £130 per annum, with board and residence. Also Resident House Physician for six months. Honorarium £25.

LIVERPOOL, CITY OF, INFECTIOUS DISEASES HOSPITALS.—Assistant Resident Medical Officer, unmarried. Salary £120 per annum, with board, washing, and lodging.

LIVERPOOL COUNTY ASYLUM, Rainhill.—Assistant Medical Officer, unmarried. Salary £150 per annum, rising to £250, with further increase to £350 on promotion, with apartments, board, attendance, and washing.

LIVERPOOL DAVID LEWIS NORTHERN HOSPITAL.—Assistant House Surgeon. Salary £70 per annum, with residence and maintenance.

LODDON AND CLAVERING UNION.—Medical Officer. Salary £125 per annum, with fees.

LONDON COUNTY ASYLUM, Hanwell, W.—Junior Assistant Medical Officer. Salary £150 per annum, with board, apartments, and washing.

MACCLESFIELD GENERAL INFIRMARY.—Junior House Surgeon. Salary £70 per annum, with board and residence.

METROPOLITAN ASYLUMS BOARD FEVER AND SMALL-POX HOSPITALS.—Assistant Medical Officers (unmarried). Salary £180 per annum, rising to £240, with board, lodging, attendance, and washing.

MIDDLESBOROUGH, NORTH RIDING INFIRMARY.—House Surgeon, unmarried. Salary £100 per annum, with board, lodging, and washing.

MONMOUTHSHIRE ASYLUM, Abergavenny.—Junior Assistant Medical Officer. Salary £150 per annum, increasing to £200, with board, lodging, and washing

NOTTINGHAM CHILDREN'S HOSPITAL, Forest House.—House Surgeon (unmarried) for six months. Salary at the rate of £100, with board and residence.

ROTHERHAM HOSPITAL AND DISPENSARY.—Assistant House Surgeon. Salary £80 per annum.

ROXBURGH DISTRICT ASYLUM, Melrose, N.B.—Assistant Medical Officer. Salary begins at £140 per annum, with board, rooms, and washing.

ROYAL HOSPITAL FOR DISEASES OF THE CHEST, City-road, E.C.—House Physician for six months. Salary at rate of £60 per annum, with apartments, board, and washing.

ROYAL MINERAL WATER HOSPITAL, Bath.—Resident Medical Officer.

ST. MARY'S HOSPITAL, Paddington, W.—Surgeon for Diseases of the Skin.

ST. MARY'S HOSPITAL FOR SICK CHILDREN, Plaistow, E.—Honorary Medical Officer. Also Ophthalmic Surgeon.

ST. MARYLEBONE GENERAL DISPENSARY, Welbeck-street, Cavendish-square.—Honorary Surgeon.

ST. PETER'S HOSPITAL FOR STONE, ETC., Henrietta-street, Covent-garden, W.C.—House Surgeon for six months. Salary at rate of £100 a year, with board, lodging, and washing.

ST. THOMAS'S HOSPITAL AND MEDICAL SCHOOL.—Assistant Pathologist and Demonstrator of Pathology. Salary £250 per annum.

SALISBURY GENERAL INFIRMARY.—Assistant House Surgeon, unmarried. Salary at rate of £75 per annum, with apartments, board, and washing.

STOCKPORT INFIRMARY.—Junior Assistant House Surgeon for six months. Salary at rate of £40 per annum, with board, washing, and residence.

WESTMINSTER HOSPITAL.—Assistant Pathologist and Curator. Salary 100 guineas a year.

WESTON-SUPER-MARE HOSPITAL AND DISPENSARY.—Medical Officer to the Provident Dispensary. Salary £100 per annum, with board, lodging, and washing.

WINCHESTER ROYAL HANTS COUNTY HOSPITAL.—House Physician, unmarried. Salary £65, rising to £75, with board, residence, &c.

WINDSOR AND ETON ROYAL DISPENSARY AND INFIRMARY.—House Surgeon, unmarried. Salary £120 per annum, with residence, board, washing, and attendance.

YORK DISPENSARY.—Resident Medical Officer, unmarried. Salary £110 a year, with board, lodging, and attendance.

Births, Marriages, and Deaths.

BIRTHS.

CHAMBERS.—On Sept. 14th, at Folkestone, the wife of W. F. Chambers, L.R.C.P. Lond., M.R.C.S., of a daughter.

COLLINS.—On Sept. 11th, at the Red House, Sawbridgeworth, Herts, the wife of Ethelbert Collins, M.R.C.S., L.R.C.P. Lond., of a son.

MALLAM.—On Sept. 15th, at Holywell-street, Oxford, the wife of Ernest Mallam, B.M., B.Ch. Oxon., of a son.

MOIR.—On August 17th, at Fairy Dene, Pinetown, the wife of Major J. Drew Moir, R.A.M.C., of a son.

MARRIAGES.

FOSTER—VIRET.—On Sept. 10th, at All Saints' Church, Finchley-road, N.W., Albert Ernest Foster, M.R.C.S., L.S.A., of Bradford, to Gertrude Caroline, daughter of the late Benjamin Pope Viret.

GORDON—MACGILL.—On Sept. 10th, at Stratford-sub-Castle Church, James Edward Gordon, M.R.C.S., L.R.C.P. Lond., to Blanche Violet (Eiley), only daughter of Campbell MacGill, of Stratford-sub-Castle, Salisbury.

MACDONALD—DE NEUFVILLE.—On August 26th, at Frankfurt-on-Main, Germany, at the French Reformed Church, by the Rev. — Correvon, George Allardice MacDonald, M.B., C.M., of Zanzibar, East Africa, to Carlotta, daughter of Adolf and Carlotta de Neufville, of 30, Wiesenau, Frankfurt-on-Main.

RELPH—INMAN.—On Sept. 10th, at St. Mary's, Kilburn, Herbert John Relph, L.D.S., M.R.C.S., L.R.C.P. Lond., to Norah, third daughter of the late R. J. Inman.

DEATH.

KING-SAMPSON.—On Sept. 10th, at his residence, Abbotsfield, Lordswood, near Southampton, James King-Sampson, F.R.C.S., in the 86th year of his age.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE SYSTEM OF PARISH NURSING.

To the Editors of THE LANCET.

SIRS,—I should be glad if any of your readers could favour me with any suggestion how to act in the following circumstances. It so happens that a parish nurse is working in my district under the auspices of the vicar of the immediate locality, and she in my opinion altogether exceeds the duties appertaining to nursing, insomuch that she receives parishioners at her own residence, tenders advice, and treats what she fancies as simple cases at their homes, and that more or less frequently without the intervention of a medical man, regarding it as "rendering first aid." As an example, I may refer to a case recently attended by myself, an infant, about seven months of age was suffering from what I may be allowed to call malnutrition, and it appeared, at least to the parents, to be progressing somewhat favourably under the treatment which I thought fit to adopt. After an interval of two or three weeks I was summoned to attend the child who was said to be suffering from convulsions, which I could not recognise, but I was surprised to find it had dwindled to a mere thread. I commenced to reproach the mother as to the long interval (about three weeks) she had allowed to elapse without my seeing it; thereupon it was explained that it had in the meantime been taken to the parish nurse who advised accordingly, *but that no medicine had been given.* The child died half an hour after my arrival. I thereupon wrote to the nurse pointing out that what she really called first aid was in reality the last, and that I should not feel justified in granting a death certificate without the coroner's sanction, and, moreover, advised her to the effect that although she stood within her legal rights in practising medicine provided she did not pretend to be qualified, which she does not, yet she must take the responsibility of the treatment on future occasions upon her own shoulders as I should be unable to give certificates in such circumstances. I moreover advised her that the General Medical Council had prohibited qualified medical men from engaging the services of unregistered persons and that she could not reasonably expect medical men in the neighbourhood to become allied with her on the score that she was employed by an independent association when we are debarred from employing her in a like capacity as individuals. To avoid, if possible, an inquest I next wrote to the coroner stating the case, and as I said that I felt certain the cause of death was natural I asked, as I was not prepared to state with any degree of certainty whether the infant would have recovered in the hands of qualified attendance, if I might certify, and received his assent. I have refused to admit this nurse under any pretext to any house I attend for the reasons as heretofore.

I am, Sirs, yours faithfully,

Sept. 16th, 1902. A PERPLEXED GENERAL PRACTITIONER.

BLOOD COVENANTING.

AN interesting reference to the rite known as blood covenanting is made by Major C. Delmé-Radcliffe, the officer commanding the Lango Field Force, in some despatches published in the *London Gazette* of Sept. 12th. When some of the chiefs, he says, said that they wished to help us but dared not, owing to the "blood-brotherhood," a sufficiently ridiculous ceremony had to be gone through to free their consciences. Dr. A. W. G. Bagshawe with due formalities injected a dose of apomorphia into the cicatrix of the incision made in the "blood-brotherhood" rites. This made the patient violently sick in about five minutes. A few nauseous draughts afterwards completed the operation and the subject's satisfaction in the breaking of the spell. Mention is made of this curious rite in the writings of ancient authors and modern travellers. It takes many forms. In some cases the blood of the covenanters is merely allowed to mingle, whether above ground or in a hole in the earth; in other cases the mingled blood is drunk. Sometimes both persons and things are simply anointed with blood. Stanley, it has been stated in connexion with this rite, has the blood of a fair proportion of the best families of Equatorial Africa in his veins.

THE SPREAD OF PATHOLOGY AMONG THE MASSES.

THERE was a mediæval diatich to the following effect:

> "Febris acuta, phthisis, pedicon, scabies, sacer ignis—
> Anthrax, lippa, lepra, nobis contagia praestant."

From this it will be seen that the infectivity of phthisis has been known for some time. But the knowledge of this among the people had died out and it was not until lately, owing in great measure to the efforts of the National Society for the Prevention of Consumption and other Forms of Tuberculosis, that the fact was realised. A remarkable instance of how the light is spreading was afforded by a case which came before the magistrate at the Westminster Police-court on Sept. 11th. Robert Clifton, a paperhanger, was summoned for travelling on the London and North-Western Railway without a ticket. The defendant pleaded guilty to travelling from Willesden to Sloane-square second-class with a

workman's ticket. He said that he had done so from hygienic views as he was consumptive and believed in isolation. Mr. Francis, however, instead of being moved by this ingenious defence, was hard-hearted enough to inflict a fine and costs of 26s. Mr. Clifton will have to try again, but we admire his brain power. He must surely be a relative of the labourer who was charged the other day with being in unlawful possession of rabbits. He was found with his pockets full of rabbits, but, according to him, he had lain down under a tree feeling tired. The rabbits had run into his pockets and had suffocated themselves. That was all he had to say.

THE QUESTION OF THE COMMUNION CUP.

WE have received from Mr. R. C. Oldfield of Liverpool a communicant's spoon, designed with a view to prevent the danger of infection from the use of a common chalice. Mr. Oldfield's idea is that every communicant should dip his own spoon into the chalice. To avoid the risk of accident the bowl of the spoon is covered in for about two-thirds of its area and it is set on to the handle at an obtuse angle. Mr. Oldfield doubtless means well and from a simply hygienic point of view his spoon leaves nothing to be desired, but in a matter of this kind hygiene is by no means the only thing to be considered.

THE TREATMENT OF ASTHMA.

To the Editors of THE LANCET.

SIRS,—Your correspondent "Rusticus" need not think that there is anything mysterious in "Dr. Tucker's atomiser." A clerical friend of mine who had suffered from hay asthma all his life was loud in his praises of the relief he had obtained from this "cure." I advised him to be careful as he was probably dealing with a potent drug which might have dangerous by-effects. After some time my friend informed me that one day when his eyes were particularly troublesome he had sprayed them and he was astonished to find his pupils dilate and the sight become dim. I replied that cocaine was in all probability the active constituent of the spray which he had used and cautioned him accordingly.

There can be no doubt as to the value of cocaine in skilled hands, but it is worth noting that a chemist remarked to me recently that the majority of his cocaine customers had contracted the habit from using nasal sprays containing the drug.

I am, Sirs, yours faithfully,
Weymouth-street, W., Sept. 13th, 1902. CHAS. W. CHAPMAN.

DETAILED MEDICAL ACCOUNTS.

To the Editors of THE LANCET.

SIRS,—I think it the duty of every medical practitioner to render a detailed account when requested so to do. It is easy if one has only method in his affairs. I inclose for your benefit my system which is simple, time-saving, and accurate. In the space of four hours my bookkeeper can get through my books for the month, enter every item, and give details, if need be, of any account in a few minutes. I claim for this method besides accuracy despatch and a saving in bookkeeper's wages. My day-book has left-hand margin, folio No., name, and address; next a narrow column for whom attended. Symbols are used, as SF. for head of family, M. for Mrs., S. for son, Dr. daughter, Cd. child, Inft. infant. Next column visit; next page B ..... £ *s. d.* The second book has name in full with address on left page with 31 spaces for the dates of the month, all of which are printed, a spare column for entering total, dates of attendance, as 5—15. Then follows £ *s. d.* and folio. When all have been cast up they are entered in the ledger thus—Sept. 5—15, £1 *5s. 6d.*—I am, Sirs, yours faithfully,

JAS. T. T. RAMSAY, L.R.C.P., L.R.C.S. Edin.
Blackburn, Sept. 15th, 1902.

To the Editors of THE LANCET.

SIRS,—Your correspondent "Ledger" would do well to continue the present method of sending out accounts. As one who has been assistant and principal for 15 years in several large practices, I can say that "doing the books" is the most detested part of a medical man's work. The amount of work required in sending out 500 accounts every quarter is very great even with the present system, and your correspondent would find that having once commenced to send them out in detail he would be unable at a future date to discontinue it, and so would be put to the expense of a bookkeeper. A patient shows that he can trust one, otherwise he would not come, and my experience is that not 1 per cent. wants a detailed account, but if such is wanted I always give it with pleasure. I am, Sirs, yours obediently,
Sept. 13th, 1902. G. P.

THE USE OF THE TERM "ENANTHEM."

PROFESSOR F. FORCHHEIMER of the Medical College of Ohio, U.S.A., writing in the August number of the *Archives of Pediatrics*, remarks that it is difficult to say by whom the term "enanthem" was first employed; he believes that it was first used by the French (Cadet de Gassicourt, 1822). After this it was employed by the Germans. In Eulenburg's "Real Encyclopedie," edition of 1880, the word is not found; but in the one of 1896 it occurs with a definition. At the present time the term has been universally adopted by the French authors; no modern description of the acute exanthemata exists in which it is not used. In Germany also, the word is being made use of more and more constantly, although Villaret's "Handwörterbuch der Gesammten Medizin" (1899) prefixes its definition by calling enanthem "ein seltenes Wort" (a rare word). Notwithstanding this, in the latest of the larger works on practice of medicine—namely, that by Schwalbe and Ebstein, vol. v. (1901)—the period of invasion in rubella is spoken of as the "Stadium enanthematicum sive prodromorum." The word also occurs in the "Dictionnaire Encyclopédique des Sciences Médicales" (1887) and in Littré. In English it is found in the following dictionaries: Dunglison and Foster's medical dictionaries; the Standard; the Century and the Imperial as enanthema, in Worcester as enanthesis, always with the definition which seems the correct one. The word *ἐνάνθημα* is not found in either modern or ancient Greek. The word enanthem is interpreted by various authors in various ways. Some claim that an enanthem is an exanthem upon the mucous membrane, the definition then resolving itself to the definition of an exanthem. A second class of definitions of the term enanthem is the one represented by Villaret—namely, "all efflorescences occurring on the inner surface of natural cavities—for instance, the nose, the throat, the mouth, &c.—without pathological distinction."

OLD BOTTLES.

A CORRESPONDENT draws our attention to what he calls "an abominable, disgusting, and dangerous practice." He refers to the use of second-hand bottles by medical men and others such as wine and spirit merchants and pickle manufacturers. He maintains that every bottle that has been used and thrown on one side for some time should not be used again but should be sold to old glass merchants and broken up and re-smelted. We cannot see that the practice of using a bottle twice over is necessarily harmful. There is no difficulty in cleansing a bottle or in sterilising it.

"A QUERY."

To the Editors of THE LANCET.

SIRS,—YOUR correspondent "Enquirer" in THE LANCET of Sept. 6th, p. 720, probably alludes to Bérillon of Paris, the Government Medical Inspector of Public Asylums, who treats morbid impulses, bad habits, masturbation, &c., by means of hypnotic suggestion, claiming that these affections are very amenable to this method of treatment.

I am, Sirs, yours faithfully,
JAMES SHAW, M.D. R.U.I.
Kensington, Liverpool, Sept. 16th, 1902.

THE ENGLISH LANGUAGE IN EGYPT.

THE weekly statistical and meteorological return of the Egyptian Sanitary Department, which has been published in French under the title of *Bulletin Hebdomadaire* since 1885, is now drawn up in the English language, the change having been effected at the commencement of July last. In other respects the form of the document has undergone no alteration.

G. S. M.—An old book, but a very good one, is Southam's "Regional Surgery." Then there is Heath's "Surgical Diagnosis," written mainly for students. With regard to medical diagnosis a small but useful book is Fenwick's "Medical Diagnosis." A book which our correspondent will find very helpful, though it is not exactly on the same plane as "Medical Diagnosis" is Judson Bury's "Clinical Medicine," published by Griffin; and an excellent book, though a large one, is Butler's "Diagnostics of Internal Medicine," published by Kimpton.

Lex.—The answer depends very much on the size of the town in question. In London, for instance, a new-comer settles down without much notice being taken of his arrival, neither does he, as a rule, call on the neighbouring medical men. But in a small town it is the custom for the newcomer to call on those already established in practice.

D.P.H.—The newest work, and for our correspondent's particular purpose perhaps the best, is Hamer's "Manual of Hygiene" (Churchill); but other good books are—Parkes and Kenwood's "Hygiene" (Lewis) and Whitelegge's "Hygiene" (Cassell).

Tunley.—Our correspondent should apply to his local sanitary authority.

ERRATUM.—We regret that in an annotation which appeared at page 759 of THE LANCET of Sept. 13th, owing to a printer's error the name of the writer upon whose paper we were commenting appeared as Dr. Giuseppe Biller. It should have been Dr. Giuseppe Bellei.

During the week marked copies of the following newspapers have been received:—*Labour Leader, Hot Springs (Arkansas), Daily News, The Umpire, Dublin Evening Telegraph, Southampton Echo, Belfast Guardian, Lancaster Guardian, Bradford Observer, Sheffield Daily Telegraph, Echo, Daily Express, Standard, Times, Windsor and Eton Express, Globe, Westminster Gazette, Derbyshire Times, Lincolnshire Echo, Burnley Gazette, Reading Mercury, Herts Advertiser, Times of India, Aberdeen Free Press, Lancashire Post, Plymouth Morning News, Western Mercury, Devon and Exeter Express, Burnley Express, Hackney and Kingsland Gazette, &c.*

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (22nd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.) West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.).

TUESDAY (23rd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Royal Ear (3 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.).

WEDNESDAY (24th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.).

THURSDAY (25th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), St. Mark's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.).

FRIDAY (26th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square, (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.).

SATURDAY (27th).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing-cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MONDAY (22nd).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Dr. A. Whitfield: Clinique. (Skin.)

TUESDAY (23rd).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Dr. J. E. Squire: Clinique. (Medical.)

WEDNESDAY (24th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. J. Clarke: Clinique. (Surgical.)

THURSDAY (25th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. Hutchinson: Clinique. (Surgical.)

FRIDAY (26th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. H. Tilley: Clinique. (Throat.)

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this Office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. I. of 1902, which was completed with the issue of June 28th, and the Title-page to the Volume, were given in THE LANCET of July 5th.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1902 are now ready. Bound in cloth, gilt lettered, price 18*s.*, carriage extra.

Cases for binding the half-year's numbers are now ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 3*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

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Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London and Westminster Bank, Westminster Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C.

SUBSCRIBERS ABROAD ARE PARTICULARLY REQUESTED TO NOTE THE RATES OF SUBSCRIPTIONS GIVEN ABOVE. It has come to the knowledge of the Manager that in some cases higher rates are being charged, on the plea that the heavy weight of THE LANCET necessitates additional postage above the ordinary rate allowed for in the terms of subscriptions. Any demand for increased rates, on this or on any other ground, should be resisted. The Proprietors of THE LANCET have for many years paid, and continue to pay, the whole of the heavy cost of postage on overweight foreign issues; and Agents are authorised to collect, and do so collect, from the Proprietors the cost of such extra postage.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied. Address—THE MANAGER, THE LANCET OFFICES, 423, STRAND, LONDON, ENGLAND.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Sept. 18th, 1902.

Date	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks at 8.30 A.M.
Sept. 12	29·67	NNE	0·32	92	61	51	51	52	Raining
,, 13	30·02	N.W.	0·01	101	58	43	43	47	Fine
,, 14	29·86	W.	...	88	61	48	54	58	Overcast
,, 15	29·97	W.	...	95	63	47	54	58	Overcast
,, 16	29·74	S.W.	0·01	104	67	49	56	58	Showery
,, 17	29·88	W.	0·03	106	62	48	50	53	Cloudy
,, 18	30·02	W.	...	102	61	44	47	50	Cloudy

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